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THE BURR CLOVERS.

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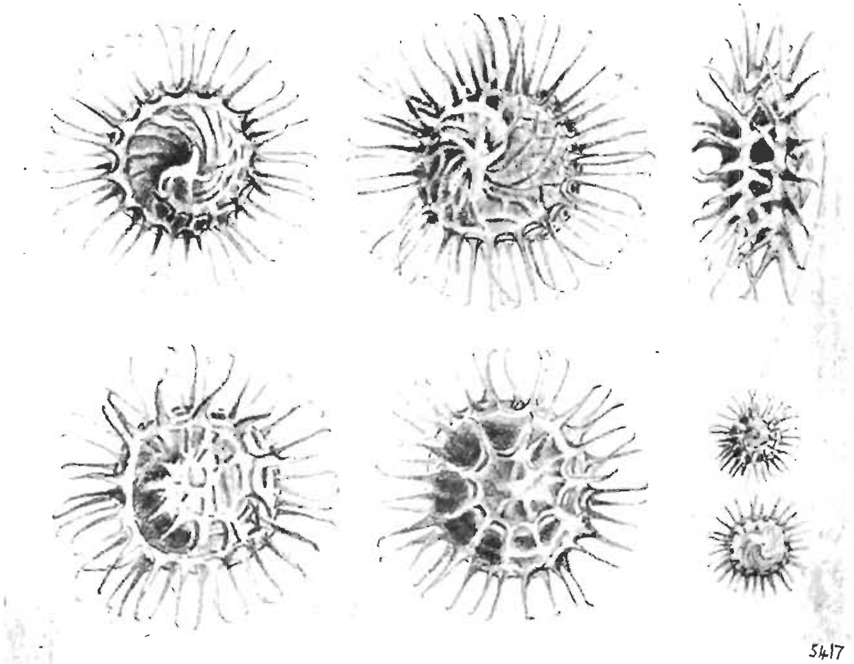
THERE seems to be a considerable amount of apprehension on the part of certain farmers regarding the likelihood of the burr clovers becoming a serious nuisance to sheepowners. It is thought that the burr-like seed-pods are liable to become entangled in the wool, and, if present in large numbers, might be the means of seriously depreciating the value of the staple. This fear is, however, to a very large extent groundless, and, as a good deal of misconception prevails with regard to the burr clovers, a general description of these plants so far as New Zealand is concerned may remove any misapprehension and thus prove of value.

THE MEDICK CLOVERS.

The genus *Medicago*, to which the burr clovers belong, consists of about one hundred species. Several, notably lucerne (*Medicago sativa*) and English trefoil (*Medicago lupulina*), are agriculturally very important, but the majority

are rarely cultivated to any extent, although it is probable that there may be a good many that would prove valuable for special purposes. In New Zealand there are four medick clovers* that are either extensively grown or have become naturalized. They are -

(1.) Lucerne (*Medicago sativa*).
(2.) English trefoil (*Medicago lupulina*).
(3.) Toothed burr clover (*Medicago denticulata*).
(4.) Spotted burr clover (*Medicago maculata*).



TOOTHED BURR CLOVER SEED-PODS, SHOWING CHARACTERISTIC SPINES.

These four clovers can easily be distinguished in various ways, but, as botanical descriptions are often more or less unintelligible to the average farmer, a simple key will be handy in order to discriminate between the different species. The seed-pods of the various medick clovers differ very much. As it is when the plants are in seed that the farmer is most likely to take special notice of them, the key on the following page may prove useful.

* Another species, *Medicago orbicularis*, a native of the Abyssinian mountains, has also been grown in New Zealand, but not to any extent.

Key to distinguish the Species of Medicago.

A. Pods armed with hooked or curved spines.

1. Pod spirally coiled in two or three lax turns. Spines slightly divergent, erect, generally hooked.
   Toothed burr clover (*Medicago denticulata*).

2. Pod compactly spirally coiled in 3 to 5 tight turns. Spines divergent and bending almost at right angles, rarely hooked.
   Spotted burr clover (*Medicago maculata*).

B. Pods without hooked or curved spines.

3. Pod spirally twisted in two or three turns.
   Lucerne (*Medicago sativa*).

4. Pod small, compressed reniform, containing a single seed.
   English trefoil (*Medicago lupulina*).

THE BURR CLOVERS.

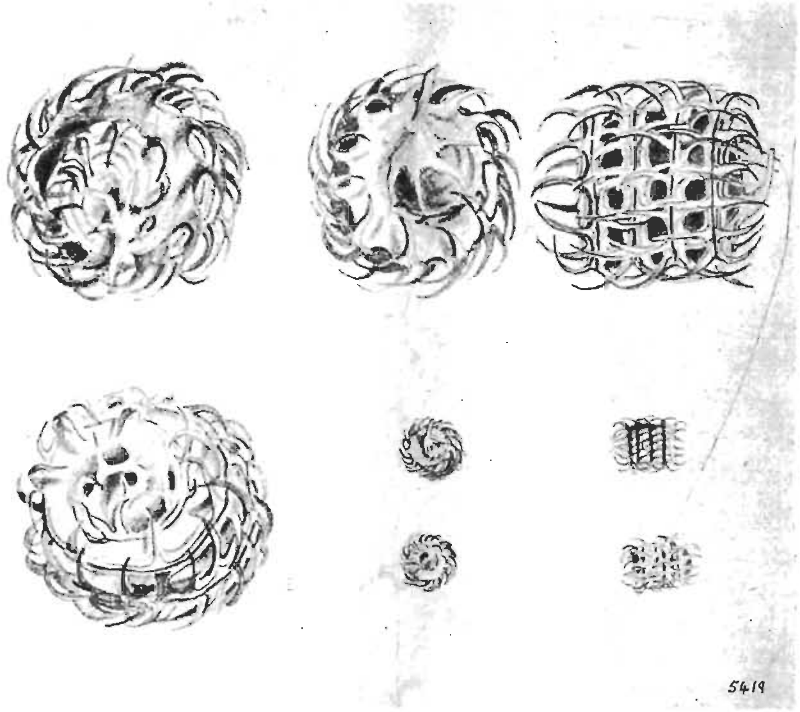
The spiny seed-pods of the true burr clovers readily distinguish them from all other species of the genus *Medicago*. In some, such as the hedge-

ENGLISH TREFOIL, SHOWING SEED-PODS (SHOWING CHARACTERISTIC MARKINGS).

hog clover (*Medicago intertexta*), the extraordinary appearance of the pods has caused them to be cultivated in gardens, more or less as curiosities. The two species with which we are concerned in New Zealand, the toothed burr clover (*Medicago denticulata*) and the spotted burr clover (*Medicago maculata*), are often confused together, but an examination of their pods should always enable them to be easily distinguished. Both these clovers are annuals, and in certain seasons two crops are regularly produced within the twelve months. They both develop creeping branches, and in this way a single plant may cover a considerable area of ground. In the case of the toothed burr clover nearly all the leaves have short petioles and are developed on the elongated creeping branches. The crown of the rootstock is left more or less exposed. This feature makes the plants readily eaten out by both cattle and sheep. In the case of the spotted burr clover a large number of leaves with long petioles are developed on shortened branches arising from the crown as well as short petioled foliage developed

on the creeping branches. Thus, the crown of the spotted burr clover is well protected, and this clover, apart from the fact that stock do not seem to care for the herbage, would not be likely to be eaten out and killed before seed-development had taken place. The spotted burr owes its name to the black spots that are often present at the base of each leaflet; but this character is not always constant, and is by no means an infallible guide in distinguishing the two species.

The burr-like seed-pods of the toothed burr clover are provided with more or less erect hooked spines. They can thus readily become attached



SPOTTED BURR CLOVER SEED-PODS, SHOWING BENT SPINES.

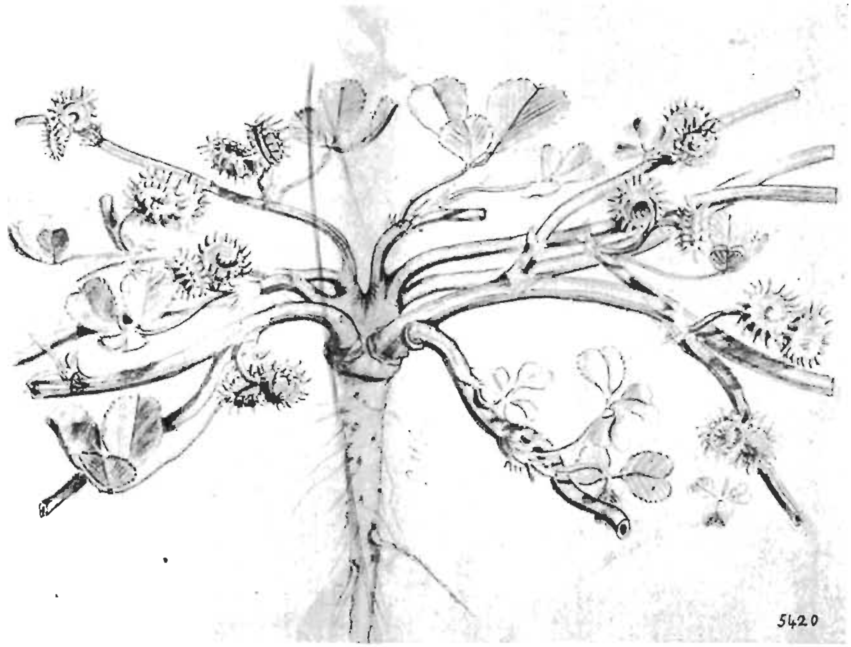
to the wool of any sheep that are grazing in the vicinity of the plants, and when present in large numbers they are liable to mat the wool together and seriously depreciate the staple. The seed-pods of the spotted burr clover, in having the spines bent over themselves and in being rarely hooked, are not so likely to cause any damage to wool.

DISTRIBUTION.

The burr clovers have been naturalized in New Zealand for the past fifty years, and even now occupy quite an unimportant position so far

as our weed flora is concerned. This fact alone is sufficient to dispel any fears as to these plants becoming in any way a menace to our wool industry.

The two species are often found together, and, in general, are mainly confined to the coastal districts, being uncommon in the interior of either Island. They are both rare in permanent pastures, being most frequently confined to roadsides, gardens, and waste places where stock seldom graze. The toothed burr clover—and this is the one most liable to damage wool—never becomes common in pastures that are at all heavily stocked. This is in a large measure due to the ease with which it is eaten out and stopped from seeding. Being an annual, an abundant production of seed is



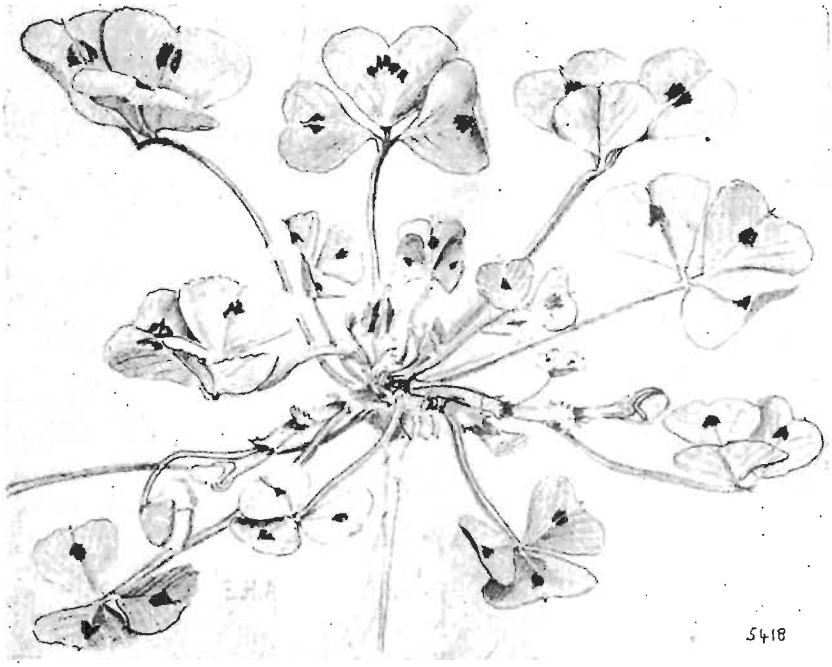
TOOTHED BURR CLOVER. PLANT, SHOWING EXPOSED CROWN.

necessary from year to year in order for it to remain established. The spotted burr clover in not being eaten by stock is more liable to persist in pastures when once established, but it does not seem to thrive well on grassed land, preferring to grow on soil that is loose and turned over from time to time.

The burr clovers were probably originally natives of the Mediterranean region, but are now widely distributed throughout all temperate countries. In Chile and the Argentine they are especially abundant, and, although the toothed burr often causes considerable injury to wool in those countries, it is there regularly cultivated as an annual crop on certain soils.

THE VALUE OF BURR CLOVERS.

Up to the present time the burr clovers have in New Zealand been looked upon merely as weeds, but in certain countries they seem to occupy quite an important place in agriculture. In Chile and the Argentine, where there are large areas of sandy soil, the toothed burr clover is regularly sown and fed off after the plants have come into flower. When fed off the ground is often laid down with prairie-grass. The previous clover crop having, through the bacterial nodules on their roots, considerably improved the nitrogen content of the soil it is rendered very suitable for the growing of a sand crop, such as prairie-grass.



SPOTTED BURR CLOVER. PLANT, SHOWING PROTECTED CROWN.

It is probable that this clover would also be found of value in New Zealand when used under similar conditions. This, however, refers only to the toothed burr clover, as its herbage, unlike that of the spotted burr, is highly relished by stock. The herbage of the latter plant, owing to the bitter properties that it possesses, is quite useless as a pasture-plant under any condition. The spotted burr clover is, however, regularly employed in other countries for cover-cropping and green-manuring. This is especially so in orchards, where improvement in the texture and enrichment of the soil is required. In California, owing to its rapid growth during the

winter months, it is used as a cover-crop in lemon-orchards, in order to thoroughly cover the ground and lessen any infection of the lemons from the soil fungus which causes the serious disease known as lemon brown-rot (*Pithiacystis citropthora*).

The United States Department of Agriculture has devoted a considerable amount of time and money to the introduction of certain of the burr clovers into grass-denuded areas, such as we possess in Central Otago, and some of the results arrived at appear to be very promising.

THE SPREAD OF DANTHONIA IN MARLBOROUGH.

THE Biologist reports that during a recent trip to the Awatere he was greatly impressed with the spread of danthonia in that district. Throughout all the lower country, and especially on the sunny faces, where originally the vegetation was mainly the silver tussock (*Poa caespitosa*), a thick sward of several varieties of both *Danthonia semiannularis* and *D. pilosa* is now present to the exclusion of nearly all other grasses. Higher up the valley, where the main grasses are both silver and hard tussock (*Festuca rubra* var.), danthonia is not yet an important element of the pastures. It is, however, only a matter of time when danthonia will be throughout the whole of the Awatere Valley the most important and valuable constituent of the natural pastures up to an elevation of 2,500 ft. It is only a few years ago since danthonia was quite a despised grass in Marlborough, but farmers there now fully recognize its great value on unploughed land where the annual precipitation of moisture is small.

POTATO-MOTH ATTACKING TOMATOES.

THE Biologist reports that the potato-moth (*Gelechia operculella*), an account of which appeared in the April *Journal*, has been quite prevalent in tomatoes in the Christchurch district. This is the first time that this insect has been recorded as injurious to this crop in New Zealand. The fruit appears to be the portion of the plant mainly attacked, but it is probable that the caterpillars will also be found feeding on the interior tissues of the leaves, just as they do in other solanaceous plants, notably the nightshade, poroporo, and tobacco. Unlike the true tomato-moth (*Heliothis obsoleta*), the potato-moth appears to prefer attacking the tomato when quite hard and green. Timely spraying with arsenate of lead, as for the control of the codlin-moth, should stop the potato-moth from ever becoming a serious enemy of the tomato. Lea, of Tasmania, has recorded this insect as attacking the tomato, but he says its effects are in general restricted to the foliage.

FLAX (*LINUM USITATISSIMUM*).

E. CLIFTON.

FLAX (*Linum usitatissimum*) signifies, as referring to the fibre-plants of the Old World, "the most useful (fibre)." This fibre formed the fabric of the general garment of the ancients. It is the contemporary of wheat, and with that grain shared the first place in primitive agriculture. Flax no longer retains pride of place among textiles; that has been usurped by cotton. Linen has given way to calico. Even the very purpose for which flax in earlier times was cultivated has changed; it was then the fibre, now it is the seed that is wanted. In fact, outside of the European Continent but little use is made of the stalk; it is the seed, known as "linseed," that is required for the oil. As this country is really interested only in the linseed, this contribution will not deal with the crop for fibre.

ITS USE.

Almost the entire crop is exported. The oil is the chief product, and, together with the dried mass of seed, finds ready markets. The oil has an assured standard for many purposes. Among these are the immense demands for paints and varnishes and for the manufacture of oil-cloth and linoleum. The by-product of the linseed, the cake, is also important: as a stock food, for stall-fed animals, it maintains its superiority over all similar preparations from other oil-bearing seeds. In New Zealand the use of specialized foods for animals is not practised; stall feeding is not necessary; our farm stock are grown and fattened on pastures and on roots in the field. There is, however, a use for the linseed that should commend itself very specially to the dairy-farmer. He would find linseed a valuable addition to the separator-milk to which he now so rigidly confines his calves—there is no better substitute for the butter-fat removed by the separator. A small area—an acre—would provide him with quite sufficient linseed for a large number of calves. The crop can be grown as cheaply as oats. The demand for well-grown calves is increasing, and must increase; there are but few cattle raised on the large farms and stations, and the grazier must depend on the dairy-farmer for young stock. The dairyman has a source of increased profit from the well-grown calf. To be well grown that calf must be well fed, and to assure this the linseed is an important factor.

Production and Proportion of Production in Grouped Countries.

The world's production, taking an average of nine years, is estimated at 78,824,400 bushels of 56 lb. The proportional production is—Russia 30 parts, United States of America 28, British India 20, Argentina 19, other countries 3. In this estimate the 30 parts of the proportion produced in Russia and the 3 parts in other countries represent the quantity from which fibre is obtained; the other parts of the world rely for the profit on the seed from the flax crop.

In the United States of America there are 3,233,000 acres of flax, producing an average yield of 11 bushels per acre. The value per bushel on the farm is given at about 4s. 2d. In Argentina there are 3,221,000 acres. In New Zealand the average for fifteen years has been 1,197 acres. It has, however, been a very changing quantity; the variations have extended from 2,800 acres to 413 acres. The yield per acre here may be estimated at 12 cwt. to 15 cwt., or 24 to 30 bushels, and the value per bushel of 56 lb. is quoted in the commercial columns of the newspapers at 7s. 6d.

Soil.

The ideal soil for flax is one that will produce a crop of wheat. It may be, with advantage, somewhat lighter in texture. Flax demands perfectly drained land. It is simply a useless expenditure of labour, of money, and of seed unless the soil is fertile and thoroughly cultivated. Flax requires the plant-food readily available. Its root-system, as compared with many plants, is weak, and it is neither deeply rooted nor are the roots nearer the surface widely spread.

The Place of Flax in Rotation.

When rotations are established flax may be the first crop on lea land, or it may follow roots or legumes. In older countries, where this crop is a part of the farm system, it is not permitted, in the rotation, to be grown on the same land more frequently than at intervals of six years; probably in this country the same precaution will be found necessary. The reason is that this plant is susceptible to certain diseases that are better controlled by the provision of clean land, or by allowing that land the time to dispossess itself of the cause of these troubles. Further, although it may be theoretically shown that flax is not a serious depleter of fertility, yet in actual practice the succeeding crop is witness that flax is an effective consumer of some important elements of plant-food. This was particularly observed on the experimental farm at Ruakura.

In New Zealand, on new land, the effects of short rotations, or of no rotations at all, are not yet appreciated: but these effects must be expected after the first fertility of virgin land becomes over-exploited. Flax is certainly a crop that must be grown with discretion.

When flax is to be cropped on lea land, this should be skim-ploughed in the autumn; then in spring it will be in condition for reploughing and for the thorough cultivation that the crop demands.

CULTIVATION.

It is claimed that flax, more than most crops, responds to the most complete cultivation. This response is no doubt caused from the fact already given, that the root-system is relatively weak; and, as it also grows and matures in a comparatively short time, it obviously requires a condition of soil easily penetrated by its roots seeking food—and that condition is provided by cultivation.

SEED.

There are many varieties. The one in general use is the Riga. It probably fulfils the purpose for this country with greater advantage than others; although the Indian or Calcutta variety is claimed to be the producer of a larger percentage of oil. Another variety, the White Belgian, has not come under observation in New Zealand. This is said to mature more rapidly than others, an advantage of no great importance in this country, where climatic conditions are not rigorous.

The quantity of seed sometimes sown is excessive—60 lb., and occasionally even more. This is not required. It should be remembered that heavy seeding results in crowded plants. For fibre such seeding is correct; each plant is then tall and branchless. A sturdy branching plant is required where seed is the objective—one that may be permitted space to develop its flower and its seed-bolls. For this purpose 30 lb. of seed of tested vitality is sufficient. At the experimental farms 40 lb. of ordinary seed afforded a satisfactory crop, but the seed was not tested for germination.

Flax appears to be particularly amenable to improvement by purification of seed and by selection of the plant. It has been found that much increased yields have been secured by the use of seed from which the lighter seeds have been removed, and the best crops have been grown from acclimatized samples so purified by cleaning. It is the common experience that the farmer buys for seed just what another farmer has grown. The seed-merchant probably passes the sample through the cleaning-machine, and the farmer buys back nothing better than his own. Why should not the farmer use clean seed and sow that which he has produced? He now sells his grain, his linseed, &c., at just market rates, but he buys his seed at special prices. As an instance, a sample of Algerian oats was sold to a dealer at market rates—about 2s. per bushel; the sacks bore some special mark. These oats were resold for seed to a neighbour at 3s. 6d. The grower discovered this. Then why should not the grower save his own grain for seed?

SELECTION OF PLANTS.

It would be well-spent time if the careful farmer would examine the linseed crop, select and mark, say, a hundred vigorous, well-seeded plants, gather these, and use the product of such plants for the foundation of a seed-plot from which future crops would be sown. The methods of improvment are simple. Purify the home-grown seed, select vigorous plants in the field, and go on with selection from year to year. There is the further development—the selection of the single plant, and propagation from that alone; but this must form the subject of another contribution. It is said that the use of improved selected seed has yielded 15 bushels per acre as compared with 11·9 bushels from ordinary seed, a gain of 3·1 bushels, or at a rate of increase of 26 per cent.

MANURES.

"Ville" *considers potash the dominant manure for linseed. He* recommends from 4 cwt. to 5 cwt. of kainit. or 1½ cwt. nitrate or sulphate of potash per acre. That, however, applies to lands that have been many years in cultivation. It is much to be questioned if, on the soils likely to be sown to linseed in New Zealand, potash will afford profitable results, as it is accepted that the supply of this plant-food is ample on the heavier lands. In Europe liberal applications of farmyard manure and of artificial fertilizers are not withheld. Here the application of phosphates may be recommended. The object of the crop is the seed, and this phosphates assist. The length of the stalk and the quality of the fibre are assumed to be specifically affected by nitrogenous manures. Here potassic applications may be unimportant. It may also be accepted that phosphates are useful on all our soils. This has repeatedly proved the one element in manuring that affords definite profit. The grower may well make tests of phosphatic fertilizers as follows: 1 cwt. to 2 cwt. superphosphate; ½ cwt. superphosphate and ½ cwt. bonedust; basic slag, 2 cwt., 3 cwt., and 4 cwt. If the soil be comparatively light, include a trial of kainit to the extent of 2 cwt. to 3 cwt., and on another ½ cwt. to 1½ cwt. muriate or sulphate of potash. These trials may be limited to quite small plots—say, areas of a chain or half a chain square—that is, one-tenth or one-twentieth of an acre.

SEEDING.

Land must be in such condition that an even, firm seed-bed is provided. This should be assured by thorough cultivation, harrowing, and rolling. Seed can be sown with the corn-drill. The depth at which it is deposited should not exceed 1½ in.—in fact, if possible, not more than 1 in. In most seasons the nearer to the surface the better, if only the seed be covered. In many countries the practice is to simply broadcast, and cover with a light brush or chain harrow. It must be remembered that linseed is but

small, and, like many other small seeds, it is unable to germinate if deeply covered. The result is that the crop is at least uneven, if not too thin. This unevenness is one of the annoyances of linseed. It arises chiefly from the unequal covering; the age of the seed is also a factor. Linseed should always be tested. If the germination is low the sample should be discarded. The time of sowing must be determined by local conditions. The occurrence of frost should be considered, as the plant in its first stage is susceptible. The season also influences the progress of cultivation and preparation of the soil. It is a waste to sow linseed on a cold, rough seed-bed.

DISEASES.

In countries where the cultivation of flax forms an essential part of farm practice the affection *flax-wilt (Fusarium lini) universally prevails.* The common designation, "flax-wilt," is descriptive of the diseased plant. It simply withers as though from want of water. The attack may appear at any stage of growth; the plant may even be destroyed before its first leaf reaches the surface of the ground. The remedy consists of maintaining a rotation in which flax is not grown more frequently than once in six years, or in the use of new land. There is also the essential precaution of using clean, pure seed. The spores of flax-wilt retain their vitality for several years, and, for the reason that the disease affects the flax after crops of other plants have been grown, the term "flax-sick" is applied to such land, where the next succeeding crop of flax often fails. The life-history of this fungus has been studied by Bolley, who claims that careful application of germicides will provide immunity from this disease. At some of the American Experimental Farms very careful tests with these germicides have been carried out. The results show that in every instance where the specified treatment was applied crops free from flax-wilt resulted when grown on clean land. The treatment recommended by Bolley is one with which our farmers are familiar. It is the grain steep or pickle of 1 pint or pound of formalin to 40 gallons of water. Care must be exercised in steeping linseed, for the mucilaginous part of broken seeds causes adhesion of the mass of seed. A remedy is to wash that mass, spread it thinly, and dry quickly. Sand or fine earth worked through it assists in the separation.

Flax is also attacked by a species of dodder (*Cuscuta epilinum*). The chief precaution against this parasite is again clean seed. This pest is not so widely extended as flax-wilt. Its presence in the crop is confined to more restricted areas. In this it is very similar to the dodder of clover and lucerne, with the difference that for those crops, as they remain in the ground for some years, the dodder is more serious than with flax, which is sown, matured, and harvested within a period of between ninety and a hundred days.

HARVESTING.

The crop is easily harvested with the reaper-and-binder; and, if free from grass or weeds, the sheaves dry quickly. Carting and stacking can be undertaken in somewhat less time than is usually allowed to wheat between reaping and stacking. It is certainly most desirable that flax should be carted so soon as it is in a fit condition to stack. The pods or bolls are prone to open and shed the seed if allowed to become saturated with moisture after having once been thoroughly dried. In this respect flax is similar to the pea and the tare.

With large areas the threshing-machine outfit is availed of. The seed is, however, easily detached from the pod or boll. The flail can readily replace the machine for the smaller areas. The dairy-farmer need not fear the task of securing the seed without the intervention of the machine. The old-fashioned flail is efficient.

Of course, if flax be grown for the fibre, the stalks cannot be passed through the beaters of a machine. On that account the heads of the bundles or sheaves are spread out and the sheaves are passed through the ends of revolving cylinders. This breaks the pods and allows the seed to fall. The stalks remain even and straight. This need not be considered here, where the plant is not grown for fibre purposes. The stalks or straw, however, form a most useful material for thatching. It also provides an excellent bedding for stock.

The consideration of flax for seed, without use of the fibre, has been the object of this contribution. In Europe the fibre is the chief object of the crop. The process of separating the fibre from the woody part of the stalk, and its further preparation, requires considerable labour; for that reason—the cost of labour—the utilization of the fibre cannot be at present contemplated in New Zealand. In Australia there has been an endeavour to deal with the fibre as a marketable commodity. It has been shown that the prepared fibre is of much greater value than the seed. In the Victorian *Journal of Agriculture*, May, 1906, flax was estimated as producing, per acre, 10 bushels of seed at 8s. (£4), or 5 cwt. of fibre at £45 per ton (£11 5s.). The special cost of preparing the fibre, as apart from the seed, was given as £4 5s. per acre. This indicates a large margin; still, increased enterprise in the production of fibre has not been observed.

Linseed-oil, the chief product of the flax crop, and with which this contribution is concerned, is obtained by crushing the seed after decortication or removal of the shell-like outer covering of the seed. It is then crushed, heated, pressed, and the oil prepared for market. An alternative process is the treatment of the heated mass with a mineral oil, which facilitates and at the same time provides a more complete extraction of oil than the pressure process alone is capable of supplying. The mass from which the oil is being extracted is passed through hydraulic machinery

in moulds of 12 in. by 20 in. by 2½ in. These are subjected to a pressure of 3,500 lb. to the square inch, the oil escaping into vessels for filtration. The moulds, on emergence from the hydraulic press, contain the well-known linseed-cake of the agriculturist.

SUMMARY.

The cost of preparation precludes separation and marketing of the fibre.

The seed "linseed" for export is the object of the production.

Linseed is a standard article of commerce. There is an increasing demand for the oil for paint, varnish, and for the manufacture of floor-coverings. Linseed-oil cake is always in demand.

Prices for oils and cakes are constant.

Linseed grown on the farm is the cheapest and most complete means of restoring fat to separator-milk. The calf fed on separator-milk to which steamed linseed is added thrives, and such calves are profitable to the dairy-farmer.

Linseed returns a profit rather less than can be obtained from wheat. Linseed can, however, be produced on lighter land than that crop.

Linseed requires careful soil-preparation. It should not be grown on the same land except at long intervals—say, six years.

Lea land, roots, or legumes may precede linseed.

Acclimatized seeds, from which inferior grains have been removed, afford the largest crops.

Linseed is amenable to improvement by seed-purification and by plant-selection. Twenty-six per cent. increase is claimed.

Ville describes potash as the dominant manure for linseed. Growers should provide plots for manure-testing.

Seed should be sown in spring, so soon as danger of frost is past, and that season has permitted good tilth and seed-bed to be secured.

Seed should be evenly and lightly covered.

Disease, flax-wilt (*Fusarium lini*), Bolle claims can be controlled by formalin steep or pickle.

Stacking should not be delayed when sheaves once dried.

A constant market is assured.

THE LARCH-LEAF CAST.

It is satisfactory to learn that the fear that the larch plantations in the South Island had been attacked by the destructive disease known as the larch-leaf cast (*Sphaerella laricina*) is quite without foundation. During the summer a good deal of defoliation has occurred, but it appears to be entirely due to the abnormal dry weather experienced.

FRENCH WHEATS.

TYPES INTRODUCED BY THE DEPARTMENT.

Several French wheats which have been introduced into England and there cultivated with success, presenting advantages over locally grown wheats, especially in qualities conforming to the modern requirements of the miller of flour, were introduced by the Department in 1908, and have now been grown in the Dominion for two seasons. The wheats have not only been tested by the Department, but have been grown by several farmers who secured seed from the Fields and Experimental Farms Division. Two advantages claimed for them are rust-resistance and non-liability to shell out. The last-named quality is of considerable importance, especially in those districts where strong winds are commonly experienced. Absence of this character is the great drawback to the Bordier and De Noe varieties of French wheats previously introduced into Canterbury.

At the winter shows farmers will have an opportunity of examining the later introductions of the French wheats, the leading varieties being Treasure, Red Marvel, and White Marvel.

Treasure is a very early variety, with a long, thick, square ear, grain long and strong, rich in gluten, straw medium length and strong, chaff white, and resists mildew. Good on all soils, especially on light. This variety was imported into England in 1905, and came quickly into favour, especially in Norfolk on light land. It withstands storms well, and is a heavy yielder. It has the brightest straw of all the French wheats.

White Marvel is an early variety. The ear is exceptionally long, and the grain very large and round. The best of the white French wheats for milling purposes; the chaff is white and the straw long, of average strength. It is said to be good on any soil.

Red Marvel is a very early variety. It has a very long ear, with grain large and plump; chaff white, and straw long and strong. It is a heavy cropper, and is claimed to be good on all soils. Although an autumn or spring wheat, from all reports it appears to do best when sown in the spring. If sown in the spring it will come to maturity at the same time as other varieties sown in the autumn. It is said to be the largest-grained and heaviest red wheat in cultivation.

The object of introducing these new varieties was that a wheat might be found which would possess some advantages over those usually cultivated in the cereal-growing districts of the Dominion. So far, experience with the French wheats under New Zealand conditions shows that there is a considerable variation between the different varieties, and that they do not possess the same superiority over local varieties that they are said to exhibit over English wheats.

The Red Marvel has so far shown the best result in this country. It is suitable for both autumn and spring sowing, while the others are early autumn wheats.

CROPS, PASTURES, AND STOCK.

A MILDER May has been seldom experienced; the character of the weather was just that demanded by the grazier, whose summer work of producing special fodder for his stock, in the shape of roots and rape, has been generally attended with disastrous results owing to the exceptionally dry season. Grass is now practically everywhere making an excellent growth, and the outlook for the farmer has decidedly improved by reason of the favourable climatic conditions during the past month. Another factor which has largely contributed towards counteracting the effect of a general shortage of roots for winter feeding is that recent favourable conditions has enabled green crops for spring feeding to be established with success, and a much larger area of Cape barley, oats, and rape have been sown than has usually been the case. Some of these crops are already well forward, and, given reasonable winter conditions, should in the spring insure much better conditions for stock than could have been anticipated earlier in the season.

There is a means in the farmer's hands of largely mitigating the loss, such as that experienced this season, from the failure of root crops. This is a more thorough preparation of the soil before seed-sowing, that careful and repeated cultivation to which the turnip so readily responds, thereby enabling it to, at least in some proportion, overcome unfavourable climatic conditions.

There is every reason to anticipate that, although there will be no real shortage of feed, the value of beef and mutton will be considerably enhanced during the next few months—beef particularly so, for there is already a shortage of forward stores.

During the past season a considerable quantity of the timothy-seed produced in the South contained considerable amounts of ragwort-seed. Farmers should be careful when sowing grass-seed mixtures on land free of the weed to see that the timothy used is a clean sample.

The first importation of Hereford cattle into Japan has just been made, two young bulls and two heifers having been purchased in England by the Japanese Government for one of its experimental farms.

DAIRY-COW ADVANCEMENT.

FORMATION OF HERD-TESTING ASSOCIATIONS.

W. M. SINGLETON.

THE keen competition at present existing throughout all human enterprise is rendering it necessary to reduce the cost of production to the lowest possible point consistent with quality. This applies with special force to the products of the dairy-farmer. Much has been already accomplished, principally by increasing the quantity produced in greater proportion than the accompanying increase in the cost of production. A great deal, however, remains to be done. It is therefore gratifying to know that milk-producers are recognizing the necessity for progress, and are studying the problems of better feeding and better care of the dairy cow. Together with an advance along these lines, which is evident to even a casual observer, is a greater inclination to cull out cows which are poor producers, and by this means and the use of pure-bred bulls of a milking family to grade the herds up to a higher producing capacity. Dairy-farmers have experienced a certain amount of success in herd improvement even where the proper test has not been applied; but more accurate information regarding the yield of individual cows is necessary in order that justice may be done to the several members of the herd. Errors of judgment have been committed in culling. Dairymen do not know just how the respective merits of their individual cows stand unless the yield of milk and percentage of fat are both considered. Did the owner milk all his cows, his ordinary judgment might be more accurate, but where a number of milkers are employed the owner cannot but lose touch with the yields of many of his animals. Weighing and testing are the only means of avoiding errors.

Two systems of carrying out herd-testing are in vogue in New Zealand. Dairymen are to be found who have been testing their individual cows for some years. Only the more progressive will carry on this work when they must undertake the labour and trouble of making the actual fat-determinations. Thus, until the association movement saw its inception in New Zealand, the yield-testing of cows was not extending rapidly. To initiate this movement, the Dairy-produce Division, with the co-operation of the Dalefield Dairy Company, established an association amongst the members of that company in the spring of 1909. In the spring of 1910 three more associations were commenced on the same lines—viz., at Kaupokonui, Stratford, and Cambridge.

SCOPE OF ASSOCIATION.

When an association is started amongst the milk-suppliers of a large dairy-factory, it is considered that, unless special circumstances intervene, the membership should not include members of another company. This being the case, there is less difficulty in getting the samples in regularly for testing, and there is less chance of friction being caused. Suppliers to a number of medium-sized factories could, however, often support a good association by co-operating with each other, whereas failure might ensue did they start separately. In such cases, a co-operative movement among such suppliers would be advisable.

FORMING AN ASSOCIATION.

Probably the most simple method of making an arrangement for carrying on cow-testing work would be by general resolution at the dairy company's annual meeting. The company could then carry on this work under the same control as exists for the ordinary work of the factory. Some suppliers who will not go to the trouble of having their cows tested might object to any increased expenditure necessitated by this work. There is, however, even from this view-point, the fact that herd-improvement means an increased supply to the factory, and a decreased cost in manufacture should be the tendency of such a result.

Provided it is agreed that the cow-testing work should not be carried on under the same auspices as the usual factory-work, a separate association may be formed. It is reasonable to expect that the dairy company among whose suppliers the association is formed would be quite willing to permit the association the use of their Babcock tester, testing-room, and steam.

ARTICLES OF ASSOCIATION AND BY-LAWS.

In the event of an association being conducted independently of the dairy company, the following articles of association and by-laws are suggested as a guide :—

Articles of Association.

1. The name of the association is "The ——— Cow-testing Association."
2. The objects for which the association is established are :
   (*a.*) To encourage improvement in dairy cows by weighing, testing, and figuring the yields of milk and butter-fat of cows owned by members.
   (*b.*) To encourage such improvement by any other legitimate means.
3. The officers shall consist of a Chairman, a secretary, and a treasurer. Three other members shall be appointed to act with these officers as a committee of management ; *or*, The committee of management shall be those who have been appointed officers and directors of the co-operative dairy company to which members of the cow-testing association supply milk.

4. The duration of office shall be one year or until successors are appointed; *or*, The committee of management being the directors of the co-operative dairy company, the company's rules shall apply respecting duration of office.

5. Meetings of the committee of management shall be held at the call of the chairman through the secretary. Three members shall form a quorum. The annual general meeting shall be held every year at such time and place as shall be determined by the committee of management. Members shall have one vote for every twenty-five cows or fraction thereof which are being milked by them and are being tested.

6. The committee of management shall make arrangements for testing the samples and figuring the returns for members of the cow-testing association.

7. The cost of this work shall be provided for as under:—

(*a*.) For each cow to be tested, the owner shall pay one shilling at the time of the first test.

(*b*.) Further payments to be made as necessary, and at the call of the committee of management.

(*c*.) All payments by members to be made on the basis of a general rate per cow.

8. Each cow once tested shall be counted as a cow for the season. After one or more tests, she shall not be replaced by another cow.

By-laws.

1. Any dairy-farmer supplying this co-operative dairy company will be admitted to membership if he agrees to weigh and sample the milk of each and every cow in his herd night and morning for two consecutive days each testing-period. The number of members may be limited by the committee of management.

2. Members shall provide balances for weighing the milk; a dipper for sampling; a sample-bottle properly numbered for each cow; and a box for holding these bottles.

3. Members shall undertake the delivery of their samples for testing at the factory or station where the testing is done.

4. The testing shall be done by the Babcock method.

5. Any member wilfully returning incorrect weights or samples shall be refused permission to take further part in the work of the association.

TAKING THE SAMPLES.

It has been ever recognized that to get the yield of dairy cows with absolute accuracy, the weighing and sampling of the milk at each milking is essential. Such accuracy is, however, only necessary in the making of official records, and the system is seldom undertaken except with pure-bred dairy cows. Needless to say, such work is not considered to be within the scope of association work of this nature.

Recognizing that dairy-farmers did not demand such accuracy in connection with their individual-cow records, and that very few could be induced to undertake such a task, this Division in the first place decided to merely ask members of associations to weigh and sample the milk from

individual cows for two consecutive days each thirty-day period. It was further suggested that if cows were in ill health or otherwise out of their normal condition, such weighing and sampling should be deferred until normal conditions again obtained. Good reliable work can be done in this way, and results have shown that the estimated yield in many instances shows only a narrow variation from the actual yield according to the factory returns.

Following is a copy of a circular of instructions sent to members before the first weighing and sampling took place :—

DEPARTMENT OF AGRICULTURE.—DAIRY-PRODUCE DIVISION.

Cow-testing.

Instructions for taking samples at the farm :—

1. The spring balance should be hung up in a place which will be most convenient. A plentiful supply of light insures more accuracy in taking the weights, and saves time.

2. The blank form for the record of the weights of the several milkings, &c., should be attached to a smooth, flat board, and hung near the spring balance. A pencil should be fastened to this board with a string of the necessary length.

3. Immediately after milking, the milk should be poured into the weighing-bucket and sampled at once. The weight should then be recorded, and the milk delivered to the can.

4. Be sure that each sample-bottle bears the number which corresponds to that of the cow.

5. The preservative will be placed in the sample-bottle, and with the addition of each sample a gentle rotary motion should be given to insure proper distribution of the preservative.

6. The sample-bottles should always be kept well stoppered. Evaporation of moisture from the samples impairs the accuracy of the test.

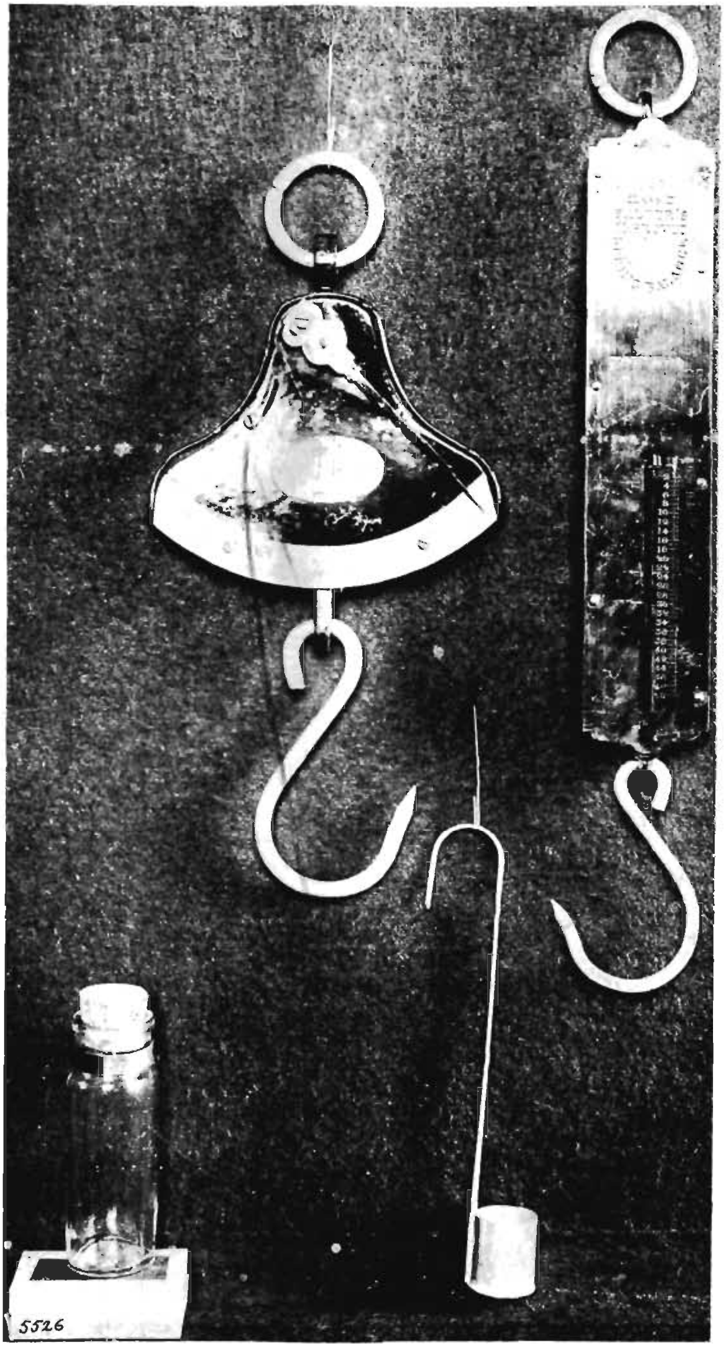
Weighing.

The weighing is done by means of a spring balance of the hook or quadrant type. Good strong balances have been used, and any procured by the Division have been subjected to inspection by the Inspector of Weights and Measures. Only those which he will stamp have been accepted. Weights of milk are usually indicated to half a pound. Balances used should indicate half-pounds.

Bottles.

A 4 oz. bottle provided with a good-sized long cork has been used with good results. The four samples should fill these bottles to within half an inch of the cork. If filled too full difficulty is experienced in getting the cream thoroughly incorporated.

These bottles are provided with brass bands around the neck, and on this band is indicated the number which corresponds to the cow which



Farmer's Outfit.
Suitable Types of Scales, Milk-sample Bottle, and Sample Dipper.

has been given the same number. If the cow's name were also put on the bottle it would probably save time in the sampling, and avoid possible errors in putting the sample in the wrong bottle. If the papers bearing these names were gummed on the bottle, and coated over with two applications of white shellac, they should stick very well despite the washing.

SAMPLING-DIPPER.

The sampling-dipper should be of such capacity that four samplings will fill the bottle as required. A short handle contributes to surer work.

BOXES.

The box should be made of fairly strong material, so as to be serviceable for some years. Those in use are rectangular in shape, the dimensions varying according to the number of bottles they are required to hold. 1 in. boards dressed make a good serviceable box. A loose shelf through which holes have been bored to hold the bottles will keep each bottle in proper position. Provision must be made against the splitting of the lid of the box. It is also necessary to provide each box with a lock to secure the bottles, which contain poisonous preservative, from children.

REQUISITES IN THE TESTING-ROOM.

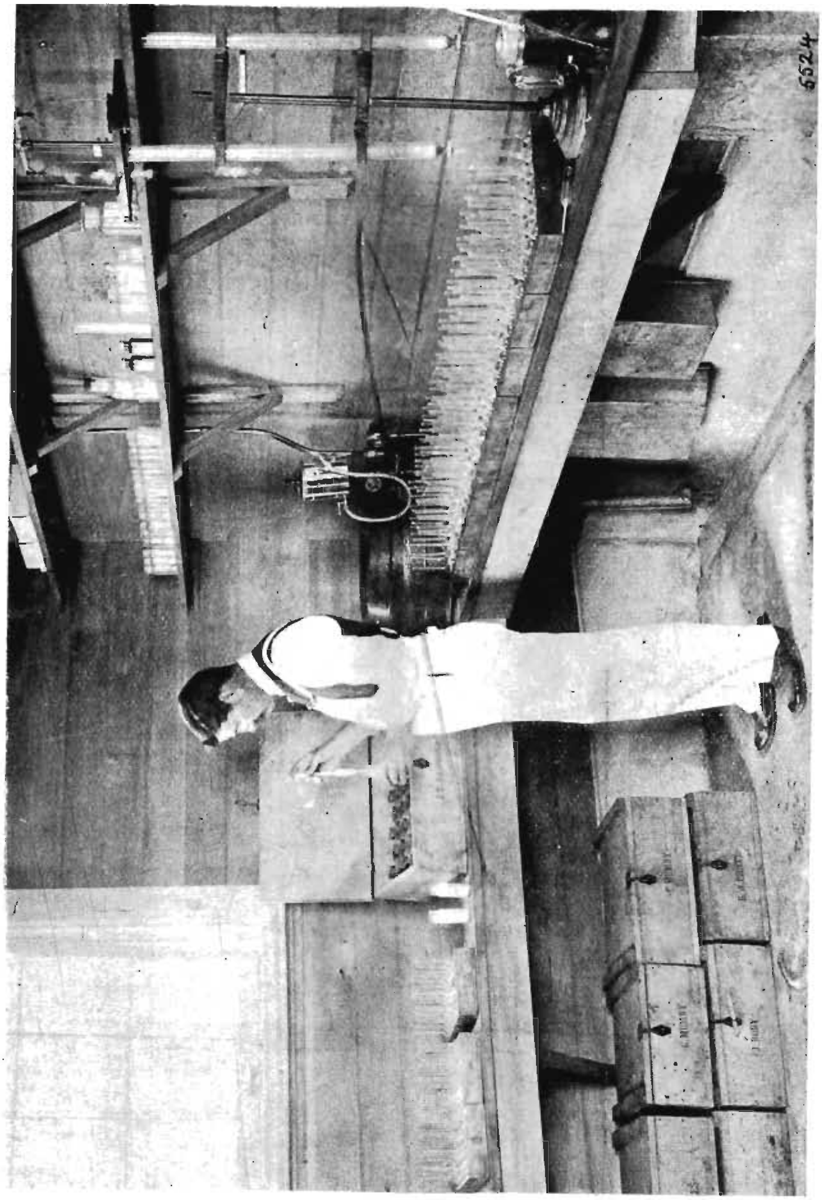
Provided the dairy company permit the association to use their Babcock tester, testing-room, and steam, with the exception of the Babcock bottles the other expense will not be large.

It has been found that the provision of sufficient Babcock bottles to hold all the samples tested in one day facilitates the work. It is at times more convenient to get a supply of steam in the forenoon. In such cases the testing officer can do his sampling in the afternoon, and then can keep the tester going almost continuously the following forenoon. The fat-percentages of one lot of bottles can be read off while another lot is being whirled. With a convenient room, one man can in this way run through about two hundred samples per day, if there be no sample-bottles to wash.

A list of the requisites necessary, with prices, would be somewhat as follows: Two gross Babcock bottles, £12 12s.; packing, 2s.; 2 lb. powdered bichromate, 2s.; one acid burette, 12s. 6d.; half a dozen pipettes (tested, 1s. 3d.), 7s. 6d.; one divider, 9d.; three thermometers (tested), 5s. 3d.; twelve blocks (with twenty-four holes), at 2s., £1 4s.; three boards (with ⅝ in. holes), at 2s., 6s.; buckets, iron trays, dippers, &c., £1 9s.; two cases sulphuric acid (244 lb. at 2d.), £2 0s. 8d.: total, £19 1s. 8d.

FORMS USED.

Two sets of forms are in use in connection with this work. Form No. 1 is for use on the dairy farm, and when the weights are filled in each period



Central Testing-room.

a copy is made. This is enclosed in the box with the samples, and forwarded to the testing-depot. Form No. 2 contains the individual records for each cow for the period, and also from the date of calving to the close of the period of the test. On form No. 2, below the individual cows' records, is indicated the yield of the average cow in the herd for the period, and also the yield of the average cow of the association for the same period.

During the first season a form No. 3 was issued, but this has not been continued. It is still compiled for office records and information. It gives a summary of the production of the various herds in the association for the period. To those associations who will supply the information included on this form to the Department each period, the Department will undertake to provide the forms 1 and 2 for the use of their members.

COW-TESTING FORM NO. 1.

Herd No. .

..............*Cow-testing Association.*

Name : . P.O. address : , 191 .

Dates of weighings : and .

Description of Cows.					Two Days' Weighings of Milk.		Test.
Name.	Breed.	No.	Age.	Date Last Calf.	Morning.	Evening.	
					lb.	lb.	
		1					
		2					
		3					
		4					
		5					
		6					
		7					
		8					

Cow-testing Form No. 2.

Herd No. .

..............*Cow-testing Association.*

Name of factory-supplier : . P.O. address : .

Cow No.	Yield for 30-day Period ending , 191 .			Total Yield from Calving to Date.	
	Milk, lb.	Test.	Fat, lb.	Milk, lb.	Fat, lb.
1					
2					
3					
4					
5					
6					
7					
8					

Yield average cow this herd for thirty-day period—Milk, lb.; test, per cent.; fat, lb.

Yield average cow Association for thirty-day period—Milk, lb.; test, per cent.; fat, lb.

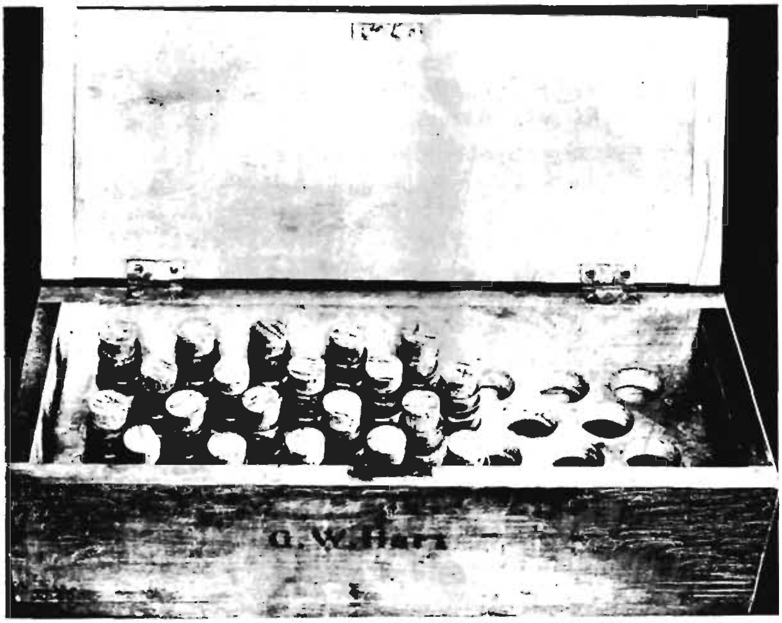
Cow-testing Form No. 3.

.... *Cow-testing Association.*

Month of ...., 19 .

Herd No.	Number of Cows.	Herd Averages.			Highest Individual Yield calculated for Month.			Lowest Individual Yield calculated for Month.		
		Milk, lb.	Test.	Fat, lb.	Milk, lb.	Test.	Fat, lb.	Milk, lb.	Test.	Fat, lb.
1										
2										
3										
4										
5										
6										
7										
8										

The items which the dairy-farmer is asked to furnish are sample-bottles with brass bands (one for each cow), a spring balance, a sampling-dipper, and a box in which to deliver the samples to the testing-depot. For a herd of forty cows, the approximate cost will be—forty bottles with brass bands (and freight) at, say, 3d., 10s.; one sampling-dipper, 6d.; one spring balance (strong and tested), 8s. 6d.: one box for samples, say, 7s.: total, £1 6s.: or about 8d. per cow for the first year, and nothing additional for succeeding years save breakages. With smaller herds, the cost per cow would be slightly higher, since the price of the balance and dipper would be divided amongst the smaller number.



FARMER'S MILK-SAMPLE BOX.

BITTER-PIT.

THE startling announcement recently made by Drs. Ewart and White, of Victoria, that the apple-disease called bitter-pit is caused by arsenical spraying, has naturally been received with incredulity by fruitgrowers. The contrary argument that has been brought forward is that bitter-pit regularly develops on fruit that has never been sprayed. Nevertheless the details of Dr. Ewart's experiments will be received with great interest, for it must be remembered that he has done a considerable amount of research in this matter, and is the leading plant physiologist of Australasia.

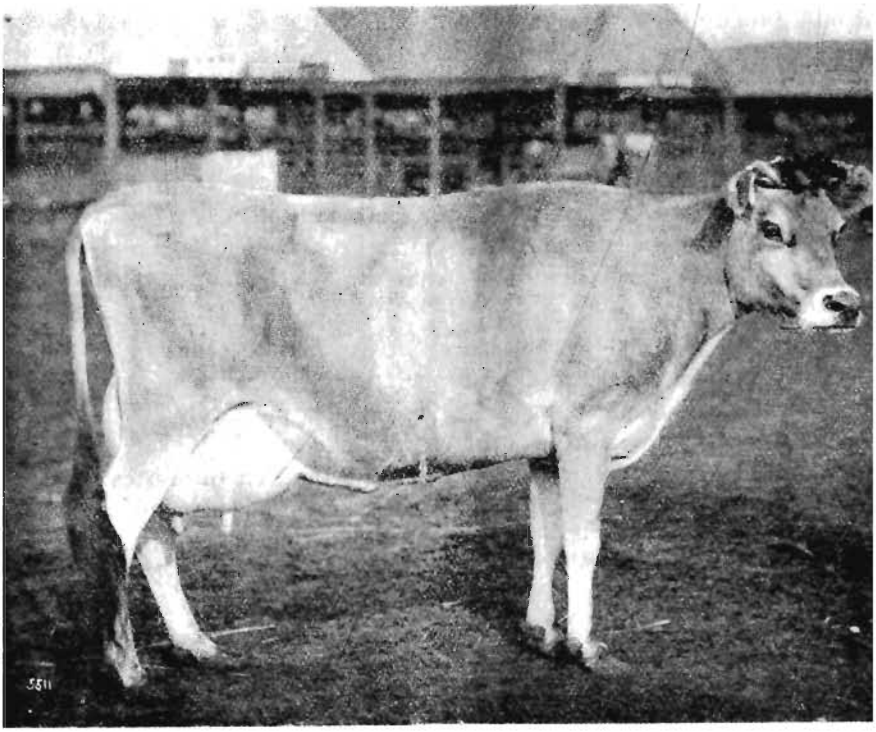
CALF-FEEDING.

J. DRYSDALE.

THAT half the breeding goes down the mouth is generally regarded as an axiom which is sound both in theory and practice with all classes of stock, but it has special force when applied to milk-producing cattle. It is not too much to say that failure to feed calves on a complete diet, either the whole milk of the dam or an effective substitute, means an annual loss of many thousands of pounds to dairy-farmers and the country, to say nothing of the disease which follows as a result of the consequent failure to build up the needed constitution in the young stock. All animals demand proper feeding and care when young in order that they may be fitted to withstand adverse climatic and other conditions when they attain maturity, and thereby insure a profitable return to the grower; but there is no domestic animal which requires greater care and attention in its young days than the cow, for there is no animal which has to stand the same drain on its constitution in its after-life, or no animal which gives the same amount of produce in a season. A vigorous constitution is imperative if a cow is to give its maximum profit, and this constitution largely depends on the manner in which it is fed as a calf.

While there should be no necessity to emphasize this palpable fact, it is interesting to note the results of an experiment conducted at the Weraroa Experimental Farm in this connection. The calves were divided up into four lots, one lot being fed on whole milk, practically direct from the mothers; another on a mixture of skim-milk and linseed (about half a cupful of linseed-jelly at each feeding); the third on Gilruth calf-food and skim-milk; and the fourth on Calf Oil Emulgent and skim-milk. The result showed that the linseed-fed calves presented much the best appearance, because of the finer condition of their hides. The true test of the experiment, however, was provided in the following spring. Then it was found that easily the best lot was that which had been reared on whole milk. They had come through the winter in a much more satisfactory condition than any of the others. When weaned and before being turned out in the winter all the calves were in about the same condition. In the cold months they were grazed in a paddock having good rough feed, being practically treated during this time as on the ordinary dairy farm. The comparison between the whole-milk calves and the others was most striking. The latter were not in the same condition in the spring, and did not

respond as rapidly when put on to summer feed. The calves fed on the whole milk were on this diet for sixteen weeks. The experiment emphasized the fact that when a calf is well started on its existence and does not receive a check it comes rapidly to maturity and develops into a heifer capable of being bred from at an early age, and then gives every promise of its progeny being healthy offspring, while it comes to its full flow without undue loss of time. Thus, while it is a very bad policy to starve a calf, it is the best of all possible means of securing a sound and profitable herd to bring the members of it to maturity in a thriving condition, and to do so there is apparently nothing to equal the natural food. Where calf-rearing substitutes are employed the calf should be fed on its mother's milk for the first week at least, and then the change from the whole to the skim-milk should be gradually brought about.



LADY VIOLA.

Dam of the great bull Noble of Oaklands, the sire of the two young bulls secured f the Island of Jersey this year by New Zealand breeders. Lady Viola is conside one of the finest cows in Jersey history. She was first over the Island of Jersey the butter-fat contest, and has been first at the Royal Show of England three y in succession.

INFLUENCE OF FERTILIZERS ON FEEDING-VALUE OF PASTURES.

SOME MOUMAHAKI EXPERIMENTS.

PRIMROSE McCONNELL.

THE above experiment has now been in being for four years and a half, and the following table shows complete results for that period (ending 31st March last), results which may now be considered to be fairly conclusive. The results of similar experiments carried out in Great Britain, on the whole, agree with those carried out at this station.

Perhaps the loss shown opposite plot No. 9 will be a surprise to many. It at least serves to show that the feeding-properties of a pasture cannot be decided by the eye; also that bulk does not mean quality- in fact, in most instances it means the reverse.

In the season of 1909 equal portions of all the plots were fenced in, and the green forage weighed. Plot No. 9 gave nearly 1 ton more than any of the other plots, and yet the financial gain on No. 9 at the end of that season was only 4s. 10d., while the gain on No. 8 was £1 19s. Had each plot been cut for hay year after year No. 9 would undoubtedly be put down as the best plot in the lot, forgetting that the hay, as well as the grass, would be of inferior feeding-value.

The sheep on each plot have been weighed, on an average, twelve times yearly, or a total of fifty-four times up to date, and each time, without exception, plot No. 8 has given the highest gain. Plot No. 6 has all along taken second place. Nos. 4 and 5 are now a long way behind 6 and 8, which shows that basic slag should not be applied to this light soil, except *in conjunction* with potash. It will also be noticed that the addition of nitrogen in the form of sulphate of ammonia has reduced the gain from £4 8s. 5d. on plot No. 6 to £2 8s. 3d. on plot No. 7. Also, the addition of nitrogen in the form of desiccated blood to plot No. 10 has resulted in a loss of 1s. 3d. Plot No. 1 has gradually risen from a loss of 13s. 5d., at the end of season 1909, to a gain of 16s. 5d. at the end of March last. It is very clear that phosphoric acid is of more value, weight for weight, in some fertilizers than it is in others. Plot No. 3 has made a steady rise from a gain of 8s. 7d. in 1909 to £1 8s. 4d. in 1911. In each year the month of June has given the lowest live-weight

gains, and December the highest; while the last season (1910–11) has given the highest total live-weight gains, in spite of the drought during the latter part of the season. During the period November, 1909, to April, 1910, the plots were stocked with cattle.

As already reported, this was not a successful experiment, and for the said period I have credited each plot with an average of the gains during similar months all through the experiment. I consider, however, that the results of this experiment should prove very valuable to farmers farming similar land. It is to be regretted that potash in some form was not applied to one of the basic-slag plots. Such a combination might have proved as effectual as superphosphates and potash. The fact that the basic slag has not in this instance given such a high return as the superphosphate in no way condemns it as a pasture fertilizer, for, in all countries where experiments of this class have been carried out, the basic slag has almost invariably come out at the top of the list; but, as I have already pointed out, it should invariably have the addition of potash when applied to light soils. On heavy or peaty soils it gives excellent results by itself—in fact, it has often proved disastrous to apply potash to a clay soil. The financial result shown on the table is the net profit or loss on the gains or losses, over and above the gains on the unmanured plot, after deducting cost of manures.

The table referred to above is shown on the opposite page.

STOCK IN QUARANTINE.

THE following stock was received into quarantine during the month of May:—

No.	Breed.	Sex.	Port of Origin.	Owner or Agent.	Address.
		MOTUIHI ISLAND (AUCKLAND).			
2	Hereford ..	Heifers	Liverpool	R. Glynn Lewis ..	Okoroire.
1	" ..	Bull			
1	" ..	Calf			
16	Jersey ..	Heifers	Sydney ..	Marriner and Jones	Mangere.
1	" ..	Bull			
1	" ..	Calf			
3	Holstein ..	Heifers ..	San Francisco	J. H. Parkinson ..	Opotiki.
		SOMES ISLAND (WELLINGTON).			
2	Hereford ..	Bulls ..	London ..	E. Short	Feilding.
6	Shorthorn ..	Heifers ..	Sydney ..	A. McLean ..	Hawke's Bay.
		QUAIL ISLAND (LYTTELTON).			
1	Hereford ..	Bull	Sydney	Wright, Stephenson, and Co.	Dunedin.
2	" ..	Heifers			

EXPERIMENT TO DETERMINE THE INFLUENCE OF MANURES ON THE FEEDING-VALUE OF PASTURES.

Plot No.	Date.	Fertilizers applied per Acre.				Cost per Acre.	Gains, Mutton and Wool, per Plot, Nov., 1906, to Nov., 1909.	Gains, Mutton and Wool, per Plot, Nov., 1909, to April, 1911.	Total Gains per Plot, Nov., 1906, to April, 1911.	Gain by Manuring.	Financial Gains per Acre on Basis of Two-thirds Live-weight Gains at 3d. per pound.	Average Number of Sheep carried per Plot, 1906 to 1911.
			Cwt.	q.	lb.	£ s. d.	lb.	lb.	lb.	lb.	£ s. d.	
1	Sept., 1906 ..	Ground lime	24	0	0	1 13 0	1,606	888	2,494	371	0 16 5	7·50
2	..	Unmanured	..			..	1,420	703	2,123	..	..	6·00
3	Sept., 1906 ..	Malden Island guano ..	1	2	2	..	..	..	..	..	..	..
	Aug., 1909 ..	,, ..	3	0	0	1 4 4	1,520	998	2,518	395	1 8 4	7·00
4	Sept., 1906 ..	Basic slag	2	2	16	..	..	..	..	..	..	..
	Aug., 1909 ..	,, ...	3	0	0	1 6 3	1,776	940	2,716	593	2 12 9	7·25
5	Sept., 1906 ..	Basic slag	5	1	4	..	..	..	..	..	..	..
	Aug., 1909 ..	Untreated	..			1 3 6	1,820	856	2,676	553	2 10 2	7·25
6	Sept., 1906 ..	Superphosphate ..	3	0	0	..	..	..	..	..	..	..
	Aug., 1909 ..	,, ..	3	0	0	1 10 3	1,886	1,127	3,013	890	4 8 5	7·90
7	Sept., 1906 ..	Superphosphate ..	3	0	0	..	..	..	..	..	..	..
	,, ..	Sulphate ammonia ..	0	1	0	..	..	..	..	..	..	..
	Aug., 1909 ..	Superphosphate ..	3	0	0	..	..	..	..	..	..	..
	,, ..	Sulphate ammonia ..	0	2	0	2 2 10	1,728	1,079	2,807	684	2 8 3	8·00
8	Sept., 1906 ..	Superphosphate ..	3	0	0	..	..	..	..	..	..	..
	,, ..	Sulphate potash ..	0	1	0	..	..	..	..	..	..	..
	Aug., 1909 ..	Superphosphate ..	3	0	0	..	..	..	..	..	..	..
	,, ..	Sulphate potash ..	0	2	0	2 2 5	1,925	1,213	3,138	1,015	4 12 11	8·23
9	Sept., 1906 ..	Steamed bonedust ..	1	3	16	..	..	..	..	..	..	..
	Aug., 1909 ..	,, ..	3	0	0	1 17 3	1,567	834	2,401	278	Loss, 9d.	7·00
10	Sept., 1906 ..	Superphosphate ..	3	0	0	..	..	..	..	..	..	..
	,, ..	Disiccated blood ..	0	2	0	..	..	..	..	..	..	..
	Aug., 1909 ..	Superphosphate ..	3	0	0	..	..	..	..	..	..	..
	,, ..	Gypsum	0	2	0	1 15 4	1,681	698	2,379	256	Loss 1s. 3d.	7·00

A SUSPECTED POISONOUS PLANT.

FROM time to time the native ngaio is said to have been the cause of stock mortality. Concerning this plant the biologist supplies the following note :—

The ngaio (*Myoporum laetum*) is a common native tree commonly found on the sea-coast in both islands. The leaves are dotted with oil-glands, which contain an essential oil. The genus Myoporum belongs to the natural order Myoporineae, certain members of which have been recorded as being poisonous to stock. The best known example is the Ellangowan poison-bush (*Myoporum deserti*). Concerning this plant, Bailey, Government Botanist of Queensland, in " Weeds and Poisonous Plants of Queensland," writes, " Great losses have occurred to travelling sheep from this plant, especially on the road from Dalby to Leyburn *via* Yandilla. Other species of this genus have been suspected of poisoning sheep."

The late Baron von Mueller, in " Extra-tropical Plants," considers a closely allied plant, *Myoporum insulare*, as possessing good feeding-value ; he also states that the ngaio is browsed on by cattle and sheep.

Turner, in " Forage Plants of Australia," says of the Ellangowan poison-bush, " This plant with some of its congeners has been suspected by some people, when in fruit, of poisoning both cattle and sheep, but my correspondents affirm differently ; and, besides, my own observations have led me to believe it capital forage for both cattle and sheep in times of scarcity of other herbage, and, in fact, sheep may be seen browsing on it at all seasons."

So far as I am aware no researches have been made towards ascertaining whether Myoporum contains any poisonous alkaloid. The remarks of Bailey seem to indicate that travelling sheep are most liable to be poisoned by the Ellangowan poison, but in this respect it appears to resemble our native tutu (*Coriaria ruscifolia*), which is extremely poisonous to animals that are unaccustomed to it, especially so when they are travelling and have been short of food. On the other hand, stock that are accustomed to tutu, eating it in combination with other feed, apparently contract no ill effects. The same thing may occur in the genus Myoporum.

An infusion of the leaves of the ngaio is, according to Cheeseman, used as a specific against mosquito-bites, so that the plant apparently possesses some special properties.

WOOL-MARKETING.

THE QUESTION OF SKIRTING AND SORTING.

J. L. BRUCE.

THE question has been asked by a correspondent: "How does one producer who does not skirt and sort secure an equal price for his unclassed wool to that of his neighbour who carefully prepares his wool for market?" This is very generally accepted. Many things are accepted, however, which are not facts, and this is one of them. The producer who neglects to properly skirt and sort may receive as much per pound as his neighbour who does so, but the question, and the one that determines profit and loss, is "Does he receive as much per head?" It may be even shown that the producer who does not skirt and sort may receive even a higher price per pound than his neighbour who does. For instance, the American buyer, who has to pay a duty of 11 cents (5½d.) per pound, cannot afford to allow yoke, dirt, and extraneous matter to carry this impost. He must have wool of as high a fibre-yielding character as possible. In contradistinction to the English and European buyer, he does not attach as much importance to style and character as long as the staple has fair length and is light in condition. Consequently the hungry wool from poorly reared sheep, which carry very light fleeces, may, and generally does, appeal to him before the better-grown, healthier, heavier, and more stylish wool. The producer of the former congratulates himself that he has secured a higher return than has the grower of the latter, but the advantage only exists on paper. When the return per fleece and per sheep is taken into account the advantage is seen to be all with the breeder who has failed to attract the notice of the American operator and has produced the better quality wool and more of it.

American and French buyers, who, for their particular purposes are prepared to pay at times even above the parity of Home values, can only operate on properly prepared and sorted lines. Where light-conditioned wool is marketed in the rough and therefore cannot attract the American operator, it presents a very payable line to the local dealer, who recognizes in the bulk of the fleece wool the making of a parcel which can be sold to the American buyer at a good profit when skirted and sorted.

It is generally the case that the producer who does not properly prepare his staple for sale does not pay the necessary attention to the feeding and

management of his flock; and it is a well-known fact that the weight of the fleece is largely determined by feeding and management. All sheep do not carry the same weight of wool: and there is a vast difference in the amount of the commercial commodity from the poorly fed and indifferently managed sheep to that from the properly fed and intelligently managed animal.

Why do the great majority of large flockowners have their clips so carefully skirted and classified by a trained expert? Simply because it has been abundantly proved that it is a profitable proposition, for each grade of wool thereby realizes its maximum value, and the total return for the whole clip is consequently considerably enhanced. There is no sounder axiom in the marketing of all primary products than that the market value is determined by the lowest quality in the parcel. A large proportion of the wool-buyers who visit this country are prepared to pay, and do pay, up to a given price for a given grade of wool; and in the case of wools that have been properly skirted and sorted the grower receives extreme value, for his staple thus meets the full force of the competition in the sale room; whereas, in the case of unskirted and non-sorted wools, outside buyers seldom or never operate, the competition being confined to local dealers, who, as is well known, go to considerable expense in skirting and sorting the wool they have been able to purchase, deriving their profit by reselling to the men who could not buy in the first place, thus making a very good thing out of the work which should have been done on the farm.

After all, the point is, Will it pay the farmer to market his wool in such a condition that it will be purchased direct by the trade, or offer it for sale in such a state that it must be left to the speculator, who is thereby enabled to make a good profit by reason of the farmer's neglect?

In his annual report, Mr. H. W. G. Millman, superintendent of the Central Markets, West Smithfield, points out that London is now practically dependent on refrigerated, as distinct from fresh-killed, meat; and any increase in the supplies of beef and mutton (an increase called for either by deficiencies in the quantity of home produce, or by the growth of demand) must be met for a considerable time by increased refrigerated supplies from Australasia and South America.

In reporting on their investigation of Australian agricultural conditions the Scottish Agricultural Commissioners express the opinion that the Illawarra breed of Shorthorns is worth fixing and improving.

THE MEAT TRADE.

FRENCH RESTRICTIONS ON IMPORTED MEAT.

In the March issue of the *Journal* there appeared a communication from the High Commissioner, Sir W. Hall-Jones, referring to the importation of frozen meat into France, in which the following statement appeared "Mr. Crabb pointed out that information previously obtained stated that meat imported into France must be in entire carcases, whereas quarters are now specified. Inquiry on the point confirmed the latter reading."

The High Commissioner communicated further in regard to the matter with the British Consulate in Paris, and he has now received the following reply :—

"With reference to your letter of the 23rd instant, I beg to acquaint you that the information supplied to you on 24th January, 1910, was obtained from the Bureau de Renseignements Agricoles. In consequence of your inquiry, application was again made to the Bureau as to its accuracy, and the same statement was repeated—viz., that the carcases of mutton imported into France must be entire.

"On further inquiry, however, at the Ministére d'Agriculture itself, it was stated that the regulation referred to by the Paris British Chamber of Commerce was correctly quoted, but it refers to the passage of the carcases through the French Customs, and requires that they be cut into quarters for that purpose.

"The bodies of the sheep, however, may be landed in an entire state from the ship, and be deposited in a bonded warehouse, where they would be kept until required to be passed through the Douane. Such warehouses would, of course, need to be accepted by the local sanitary authority as fit for such use before being utilized for the purpose.

"I may add that the above information was furnished by the courtesy of the Department, His Majesty's Consulates not being authorized to correspond directly with the French Government."

In comparing the live-stock of Great Britain during the past two decades it is shown that there has been a decrease of 839,024 sheep in the last ten years over the preceding decade, or 3·11 per cent., while an increase in cattle has been recorded of 356,322, or about 8 per cent.

GRAZING EXPERIMENT.

G. DE S. BAYLIS.

FOLLOWING is the result of a private experiment conducted by Mr. A. H. Russell, at Tunanui, Hawke's Bay :—

Total Acres in Paddock.	Manured.	Manures per Acre.	Previous Capacity.	Sheep actually carried.	Sheep per Acre.	Lambs marked.	Per Cent.
			A.—MANURED.				
130	120	2 cwt. super.; 2 cwt. blood and bone	150 ewes	270 =	2·07	276 =	102·2
			B.—NO MANURE.				
145	Nil	Nil	180 ewes	180 =	1·24	176 =	97·7

Manured (2 cwt. of Japanese super. and 2 cwt. of blood and bone per acre): 270 ewes, less 7 deaths, and 38 dry ewes = 225 wet ewes. No manure: 180 ewes, less no deaths, and 40 dry ewes = 140 wet ewes.

Manure: Lambs marked 276, sold fat 56·8 per cent. No manure: Lambs marked 176, sold fat 44·8 per cent.

Manured: The wet ewes averaged slightly over 8 lb. of skirted wool, the wool being particularly sound, bright, and very free. No manure: The wet ewes averaged 8 lb. of skirted wool, the wool not being in such good condition as that from the sheep on manured paddock.

Cost: Mr. A. H. Russell estimates the cost of manuring at £1 10s. per acre, this including the cost of manure, cartage, and distribution, but not including interest upon the outlay.

The sheep were put on the land early in May, and the record was kept up to the second week in December. Ten acres of the 130-acre paddock had no manure applied to them. The carrying-capacity has been worked out upon the total area—viz., 130 acres.

NOTES.

The experiment was carried out by Mr. Russell at his own expense upon 130 acres of land, of which 120 acres had been top-dressed. This

paddock was grazed against another paddock of 145 acres in extent which had received no treatment.

Briefly, just under double the number of ewes were carried upon the manured portion, and the percentage of lambs marked was over 100, while the percentage upon the no-manure was 97·7. On the manured portion 14 per cent. of the ewes were without lambs, while 22 per cent. were without lambs upon the non-manured paddock. Of the lambs marked upon the manured land 56·8 per cent. were sold fat, while at the same date on the no-manure land 44·8 per cent. were all that could be obtained.

Coming as they do in a dry season the results are very satisfactory, and the pastures should benefit from the dressing for a considerable period. The cost—viz., £1 10s. per acre—is somewhat of a drawback to the extensive use of such dressings upon the poorer classes of lands. It must be remembered, however, that for the most part these dressings for permanent pasture act upon the leguminous plants contained within the sward, and largely through them upon the grasses during the second and subsequent years. Where clovers, &c., are but scant, returns from the use of fertilizers will be small in proportion to the quantity of manure needed. The key, therefore, to the position of the economical and successful top-dressing of pasture lands lies in the procuration of a suitable implement which will enable us to put into the soil a few pounds of clover and other seeds at the same operation and with the same implement which performs the top-dressing. In this way I have very little doubt that Mr. Russell could obtain practically the same, if not better, results with about half the quantity of the manure used in this instance, and therefore at nearly half the cost, which is a point I would recommend to the consideration of all who contemplate the renovation of their pastures by the use of artificial fertilizers.

AGRICULTURAL-SHOW DATES.

THE WINTER FIXTURES.

National Dairy Show, June 20–23, Palmerston North.
Dominion Dairy Show, July 5–8, Hawera.
Otago Winter Show, August 15–19, Dunedin.

Secretaries of rural show societies in general are requested to forward the dates of the shows of their organizations as soon as available, for notification in this *Journal*.

The two draught stallions located at the Ruakura Experimental Farm are performing the work of the ordinary cart-horses on the property. They are regularly employed in the drays, and, it is satisfactory to note, they are extremely docile. The object is to maintain the horses in a healthy condition as well as to insure the maintenance of their power as sires.

CO-OPERATIVE FIELD EXPERIMENTS.

SOME TESTS WITH OATS.

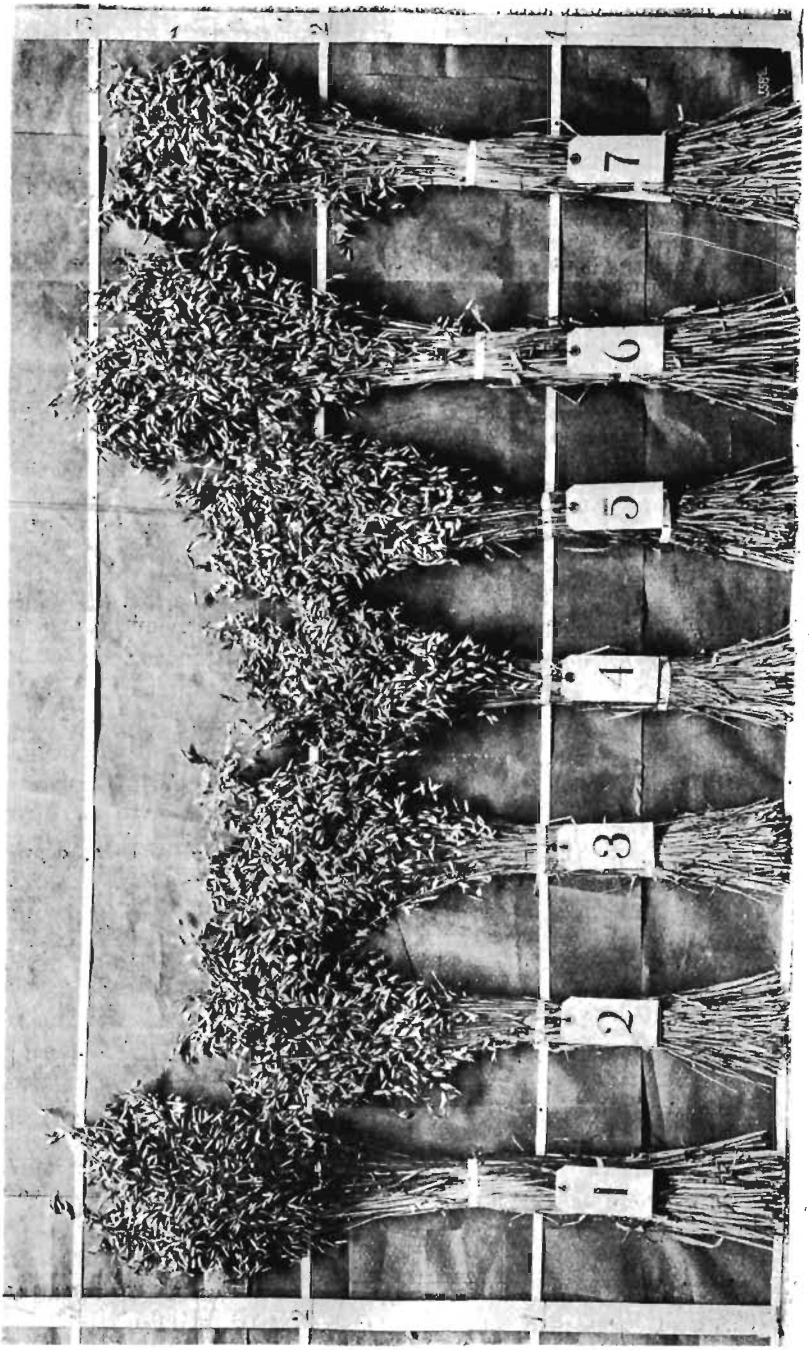
A. MACPHERSON.

AT the request of the Ashburton Agricultural and Pastoral Association experiments have been conducted on the farm of Mr. George Lamb, consisting of manurial and variety tests. The land on which the experiments were carried out was a light loam on a clay subsoil above shingle. In 1905 it was in wheat, and sown out with grass till 1909, when it was again broken up and sown with wheat without manuring. On the 2nd March, 1910, it was skim-ploughed, and was then ploughed on 10th April 7 in. deep; on the 10th August it was disc- and tine-harrowed; on the 12th August it was sown with oats at the rate of 2½ bushels per acre, and harrowed. It was subsequently sown with grass, and then rolled.

OAT MANURIAL TEST.

The area consisted of seven plots of one-twentieth of an acre each. The seeds and manures were drilled in under favourable conditions. The soil throughout the plots was of a uniform character. One plot was sown with Black Excelsior oats, and six plots with Garton oats.

The plots were sown with fertilizers according to a scheme designed by the Chief Agricultural Chemist. The weather-conditions from time of sowing up to December were most unfavourable, high winds and drought severely checking the growth. The rainfall in August was 1·41 in.; September, 0·66 in.; October, 0·4 in.; November, 2·04 in.; December, 3·17 in.; and to 11th January (date of harvesting), 0·46 in. The rains in December proved very beneficial to grain crops, which up to that time were very stunted in growth, and although the straw of oat crops generally was very short, the ears were filled with fairly plump grain. Prior to cutting, the crop was badly shaken by a north-west wind.



SHEAVES FROM THE MANURIAL PLOTS.

Following are the results :—

Plot.	Manures applied per Acre.	Cost of Manures per Acre.	Grain. Yield per Acre.	Grain. Gain or Loss by Use of Manures per Acre.	Grain and Straw. Yield per Acre.	Grain and Straw. Gain or Loss by Use of Manures per Acre.
		s. d.	Bushels.	Bushels.	Tons.	Tons.
1	Superphosphate, ¼ cwt. ; seed-gypsum, 1¼ cwt.	3 10	22·5	Loss 10·5	2·019	Loss 0·042
2	Superphosphate, ¼ cwt. ; seed-gypsum, 1¼ cwt.	3 10	33·0	Nil	1·906	„ 0·155
3	Superphosphate, ½ cwt. ; seed-gypsum, 1 cwt.	4 9	38·5	Gain 5·5	1·957	„ 0·104
4	No manure	..	33·0	..	2·061	..
5	Superphosphate, ¾ cwt. ; seed-gypsum, ¾ cwt.	5 5	41·0	Gain 8·0	2·327	Gain 0·266
6	Superphosphate, ¾ cwt. ; nitrate of soda, ¼ cwt. ; seed-gypsum, ½ cwt.	8 11	37·0	„ 4·0	2·639	„ 0·578
7	Seed-gypsum.. ..	3 0	28·5	Loss 4·5	2·346	„ 0·285

OAT VARIETY TEST.

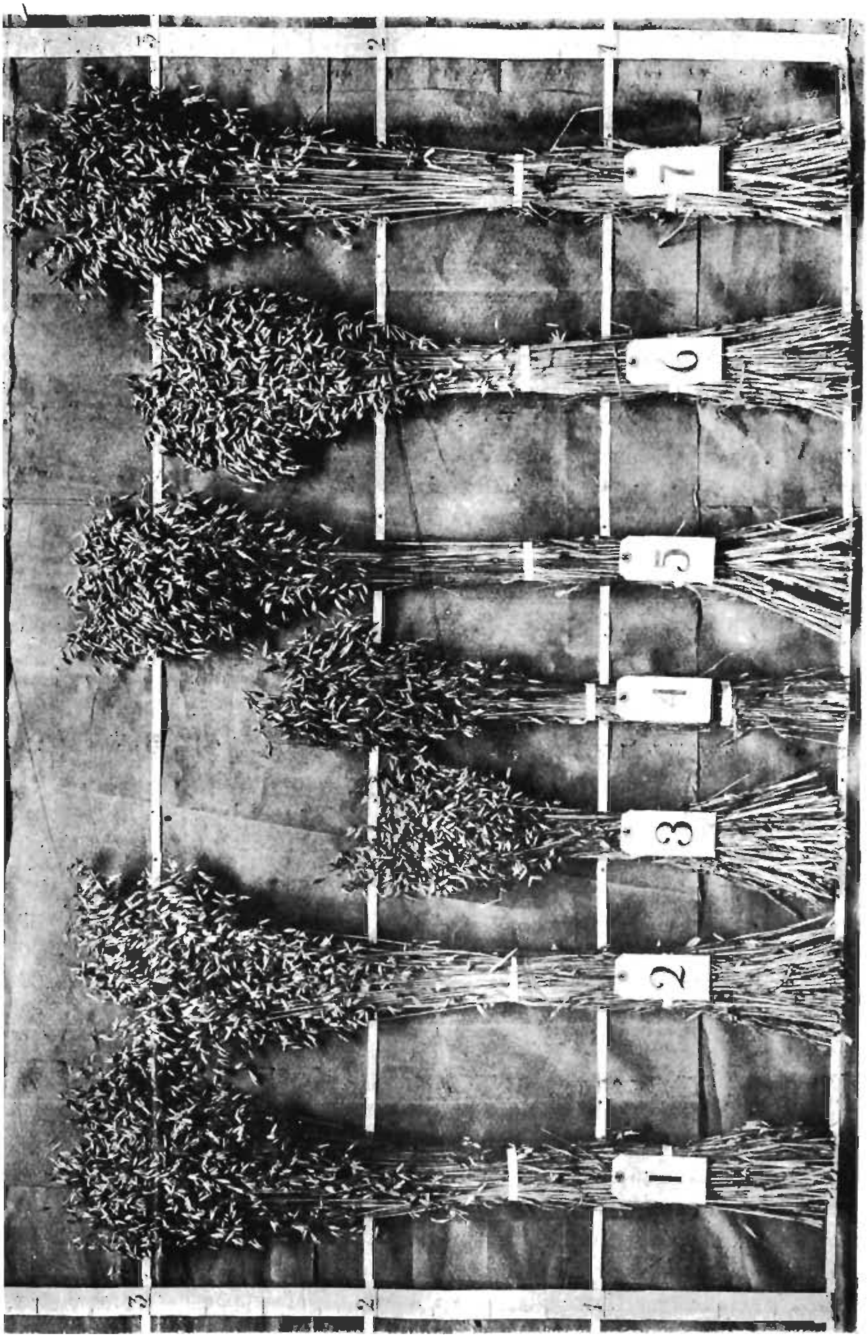
The test was carried out in the same field as the manurial one, and adjoined it. The land received the same working; the varieties of oats were sown and harrowed on the same date, and were subjected to the same unfavourable weather-conditions as the manurial tests.

Seven varieties of oats were sown, without fertilizers, in plots of one-twentieth of an acre each ; the seeding being at the rate of 2½ bushels per acre. Following are the results :—

Plot.	Variety.	Grain : Yield per Acre.	Grain and Straw : Yield per Acre.	Number of Plants to Square Yard.
		Bushels.	Tons.	
1	Danish	36·25	2·578	130
2	Garton	35·5	2·587	139
3	Black Excelsior	30·25	1·329	143
4	Algerian	15·125	1·310	136
5	Banner	35·5	1·985	94
6	Black Tartarian	23·0	2·684	123
7	Triumph	36·375	2·731	125

The Algerian variety ripened first, and the yield was greatly reduced owing to a severe shaking by a strong hot north-west wind prior to its being cut. The other varieties suffered, but to a less extent.

During the year 1910 the only meat-exporting country that increased its output for the London market was Argentina, and that by the enormous figure of 122,346 tons, or something over 35½ per cent.



RECLAIMING POOR LANDS.

PROGRESSIVE WORK IN THE NORTH.

ONE of the most pressing problems in the Auckland Province is the discovery of a means of effectively utilizing the great area of poor lands in that part of the Dominion, and which extend in a southerly direction to the centre of the Island. The Department has already accomplished a great deal in demonstrating at its Waerenga and Ruakura Experimental Farms how such country can be utilized to advantage. Settlers in other parts of the province are also experimenting to the same end, and in many instances their efforts have been attended with the most encouraging results.

During the course of the Auckland Winter Show the Minister of Agriculture, the Hon. T. Mackenzie, was invited to inspect the work of bringing gum lands into profitable use by a settler (Mr. Knight) at Albany, a few miles to the north of Auckland. Several gentlemen accompanied the Minister, and the visit was most instructive.

About three years ago Mr. Knight took up 300 acres of partly hill land and partly swamp land, presenting some slight difficulty in draining. He cleared, cultivated, and sowed grass on a portion of the hill land, and did the preliminary work of draining the swamp, which promises to be successful. The hills are of a comparatively poor nature. The grass is fairly satisfactory, but the mixture sown for permanent pasture contains too large a proportion of Italian and perennial rye-grass, and thus has before it a period of deterioration pending the establishment of the more permanent grasses which require a longer period of maturity to assert themselves. Owing to the conditions of tenure Mr. Knight did not continue his work on this property. Realizing, however, the possibilities in such country under proper treatment, Mr. Knight purchased another property in the neighbourhood, where he is continuing his enterprise. He has already a considerable portion of hilly country cleared, ploughed, cultivated, and in crop. At the present time he has a few acres of oats ready to be cut for fodder. Considering the dry nature of the season he has also a very useful crop of swedes. Mr. Knight has made a variation in the usual process of manuring. He applies about 3 cwt. of superphosphate and 3 cwt. of lime to the acre, mixing these immediately before sowing. His object in doing this was the very reasonable one of providing an alkaline manure

by the combination of the two. The result has proved the wisdom of the procedure. On one portion 7 cwt. of lime was added to the usual phosphatic manure, and the result is very gratifying. On this land he has sown perennial and Italian rye-grass with cocksfoot (15 lb.) and clovers. The last-named are coming into prominence, but the cocksfoot is as yet not so noticeable. Ultimately it will be probably more useful than the ryes. It is to be regretted that grasses of a more permanent nature have not been included in the mixtures employed, as it is evident from Mr. Knight's work that these can be cultivated on such land; in fact, this progressive northern settler has led in a very definite direction in this connection.

Mr. Knight is a firm believer in the value of tile draining. The tiles he obtains from the works on the Waitemata, and he is using many thousands of them. He is looking for the ultimate success of his district to small areas for grazing associated with larger areas in fruit. He, and other settlers at Albany, have well tested the gum lands they are breaking in as to their suitability for fruitgrowing. It is indeed from the fruit produced that the wealth of the community is mainly derived. Several very productive orchards were observed by the Ministerial party, including a well-kept vineyard of several acres in extent, from which, during the past season, the owner derived a very handsome profit. The vines were entirely of table varieties, principally of American origin. It may be submitted, with the climate and soil, that vines producing more valuable fruit than the American varieties should be included in the establishment of vineyards in the district in the future.

The community at Albany is comprised of progressive men. A representative deputation, knowing well their desires, waited on the Minister and went directly to the point—that some 10 acres of land might be devoted by the State to certain objectives of the local fruitgrowers' association. On a portion of this it is proposed to erect a hall, 4 acres to be devoted to fruitgrowing. On 2 acres of this the settlers will conduct operations, and they desire the Department to deal with the remainder for the demonstration of suitable fruits for the locality. The deputation was received sympathetically, the conciseness and directness with which they expressed their wants being appreciated.

Cattle-breeding in Venezuela is becoming a source of exportation, and the first consignment of frozen meat has been sent from Puerto Cabello to London. A company is being formed with the object of creating a regular line of navigation between London and Venezuela, the ships being furnished with refrigerators for meat, fresh fruits, and unrefined sugar (muscovado).

THE PASTEURIZATION OF SEPARATED MILK.

DEMONSTRATION AT GLEN OROUA.

C. J. REAKES, D.V.Sc., M.R.C.V.S.

THE continuation of the demonstration of the pasteurization of separated milk carried out by the Dairy and Live-stock Divisions of the Department at the Glen Oroua Factory, and now practically finished, has not only yielded some interesting and valuable information, but has still further confirmed the value of the process as a means of preventing the dissemination of tubercular disease among pigs (and, by analogy, calves also) through the medium of separated milk.

The earlier results were published in the February issue of the *Journal*, at which period the results showed most striking figures.

HOW THE EXPERIMENT WAS CONDUCTED.

Before proceeding to deal with the further results of the demonstration it will be well to detail the system adopted in carrying out the work, the objects aimed at being—(1) To insure effectiveness in pasteurizing the milk; (2) to insure that accurate and exact information as to practical results was secured.

As regards the first point, the control of the pasteurizing process was, through the courtesy of the directors of the dairy company, placed entirely in the hands of Mr. A. Cook, an experienced officer of the Live-stock Division, who was in charge of the work throughout, save for a short period when he was relieved by Mr. O'Dea, Dairy Instructor.

In order to obtain reliable results the following measures were adopted:—

(1.) A special ear-mark was placed upon the left ear of all pigs fed wholly upon the pasteurized milk. Those fed only partially upon this milk were marked on the opposite ear.

(2.) All pigs fed wholly upon pasteurized milk were also marked with numbered metal ear-clips, each individual owner's pigs being marked with clips bearing a separate number. This enabled us to be clear as to which farm any individual pig came from when it was found to be affected with tuberculosis, and it became necessary to make investigation into the source

of infection. This measure has proved of the utmost value, as will be realized later.

(3.) Mr. Cook, the supervisor, kept in personal touch with the farmers throughout, and did all in his power to insure accuracy in ear-marking. He also, thanks to the co-operation of the owners, was able to advise us of the despatch of pigs to various export works for slaughter, thus enabling the inspectors at these works to be on the look-out for the animals and to take careful and special note of their condition when slaughtered.

ACTUAL RESULTS.

And now as to the actual results of the experiment. The total number of pigs fed during the whole course of the tests wholly upon pasteurized milk and examined on slaughter is 331, of which twenty-two have been found affected with tuberculosis. This at first sight would appear somewhat discouraging after the particularly excellent results recorded earlier in the season : but, thanks to the system of marking each individual pig so that its owner could always be known, we were able to ascertain that the animals had been exposed to other definite sources of infection, which were quite capable of being responsible for the presence of the disease in them. It is a notable fact that the ownership of twenty-one of these twenty-two pigs was divided among six farmers only. (The remaining pig was only very slightly affected, and, unfortunately, in its case the number on the ear-clip was not recorded.) Of these six farmers, one alone owned seven of the diseased pigs, all of which were slaughtered on the same day (batch No. 15).

The total number of suppliers to the factory is twenty-five, hence nineteen went through the season without haying a single pig found affected on slaughter, this in itself being a clear indication of the effectiveness of proper pasteurization. Careful inquiries and investigations made on the farms of the six owners of the tubercular pigs by Mr. W. W. H. Edwards, M.R.C.V.S., and Mr. Cook revealed the fact that the pigs in question had been exposed to other quite understandable sources of infection. The facts concerning these are worth giving in detail.

Farm No. 1.—Four pigs affected, all killed the same day (batch No. 12). It was found that these pigs had been allowed to run in a paddock with cows. Examination of these cows resulted in two being found affected with tuberculosis, one being an especially bad case. No doubt the droppings of these cows infected the pasture, and the pigs thus acquired the infection.

Farm No. 2.—Three pigs were affected, all having been killed on the same day (batch No. 13). In this case investigation showed two well-marked sources of infection, viz.—(1) They had been feeding with an older

pig which was found on examination to be badly affected with tuberculosis, having a cough and a nasal discharge, and being undoubtedly an active spreader of infection; (2) they had been bought as weaners from another farmer, who evidently has tuberculosis extensively distributed on his place. Of eight pigs not wholly fed on pasteurized milk sent from his farm for slaughter, six were found badly affected with tuberculosis.

Farm No. 3.—Here seven pigs all killed on the same day (batch No. 15) were found tubercular, all being very badly affected. Investigation showed that these pigs had been running and feeding with another, suffering from a cough and nasal discharge, which had gradually wasted until it got into such a wretched condition that it had to be killed. This pig was found to be badly affected with tuberculosis. No doubt the seven contracted the disease from it.

Farm No. 4.—Two pigs included in batch No. 15 and one in batch No. 19 were found tubercular, but only very slightly affected. Investigation, so far as it has gone, shows that these pigs at an earlier period had access to a paddock where cows were running. This points to the probability of infection from the paddock produced by the droppings of tubercular cows. Further inquiries are in progress regarding this farm.

Farm No. 5.—Included in batch No. 15 one pig, and in batch No. 21 two pigs, were found tubercular. Here two sows presenting all the outward indications of tuberculosis were found. These pigs could have contracted the disease from them. The sows have since been slaughtered, and found to be well-marked cases of tuberculosis.

Farm No. 6.—One pig (included in batch No. 20) was found to be slightly affected with tuberculosis. On inquiries being made as to whether the pigs on this farm were exposed to any other source of infection it was ascertained that one of the cows on the farm was suffering from tuberculosis. The pigs having had access to the paddock in which the cows were running no doubt contracted the disease from the infected pasture.

Possible Infection by other Means.

I might note here that it must be clearly understood by farmers that it is absurd to expect feeding upon pasteurized milk to prevent pigs contracting the disease from other sources than milk, if exposed to such infection, or to cure the disease if already present when they go upon the pasteurized-milk diet. This last point is clearly illustrated by the results of the examination of those pigs, also from Glen Oroua suppliers, which were fed only partially upon the pasteurized milk, a considerable number of which were found affected with tuberculosis. These facts are particularly striking when considered in the light of results obtained from the pigs fed wholly upon the pasteurized material.

As regards the pigs from the same immediate neighbourhood fed upon milk not pasteurized, the figures reveal such a serious state of things that no one should fail to realize the position and the urgent necessity for the prompt application of the measures necessary for dealing with this most troublesome and costly disease.

PASTEURIZED MILK A BETTER FOOD.

Apart from the question of disease, the pasteurized separated milk has proved a much better food for both pigs and calves than did that not pasteurized. The animals throve better upon it, developing well, and, in the case of pigs, putting on flesh and weight steadily and consistently. The chronic indigestion, accompanied by more or less scouring, so common in the past, was absent, this no doubt being the result of the general purification of the milk which is effected by the process. As a matter of fact, some farmers have gone so far as to state as a result of their practical experience that, in their opinion, the pasteurization of separated milk would be well worth carrying out if only for this reason alone. That there are good grounds for this opinion cannot be gainsaid, for there is certainly a great necessity for the adoption of better methods of feeding both pigs and calves than those generally obtaining. In the case of calves especially, a very large proportion start their adult career with constitutions weakened and undermined by improper and inadequate feeding during the earlier months of their life. Many of these in time become dairy cows, and both their milk-yielding capacity and their powers of resisting disease must necessarily suffer as a result of their lack of full constitutional power.

RESULT SUMMARIZED.

The results of the demonstration, which is now practically at an end, may be summed up in the following conclusions :—

(1.) That proper pasteurization of separated milk is thoroughly effective in preventing the spread of tubercular disease through its medium among pigs fed upon it. It can logically be considered as being equally effective in the case of calves.

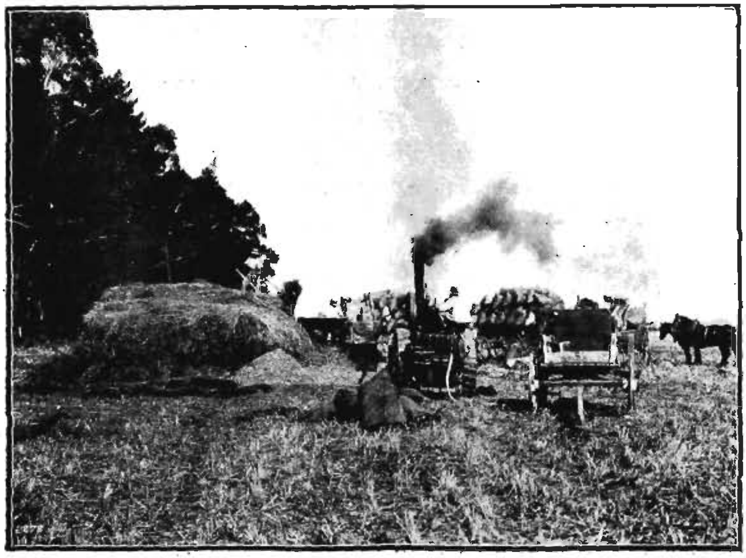
(2.) That, apart from the question of disease, properly pasteurized milk forms a much better food for both pigs and calves than does milk not pasteurized.

(3.) That if pigs are fed wholly on properly pasteurized milk right from the time of weaning, and are not allowed to come into contact with tubercular pigs, or to have access to paddocks in which tubercular cattle are or have been running, they will remain free from tuberculosis unless exposed to other sources of infection unusually met with on the ordinary dairy farm. This conclusion, again, can logically be applied to calves also.

In conclusion I would express my great appreciation of the courtesy of the directors of the Glen Oroua Dairy Company in placing their factory at our disposal for the purposes of this demonstration, and my thanks for the cordial assistance rendered by the factory-manager, Mr. Cameron. The factory-suppliers also must be thanked for their hearty co-operation, without which the exact records, now published, could not have been obtained.

LIMING RECLAIMED LANDS.

A STRIKING example of the value of lime to light partially drained (*surface* drains only) swamp land is to be seen at the Ruakura Experimental Farm. Part of a field was selected for the liming experiment. One-third of the plot received 1 ton of ground burnt lime, another equal portion ½ ton, and the third portion 5 cwt. The first season a crop of oats was grown, but there was no sign whatever of any effect of the liming. A catch crop, consisting of peas, oats, and barley followed. At once the benefit of the liming was demonstrated. Where the ton had been applied the growth was luxuriant and vivid in colour, the rate of development declining with the reduction in the lime content of the soil, the unlimed portion being in strong contrast to the rest of the field.



FEEDING OF DAIRY STOCK.

NEW ZEALAND AND AUSTRALIAN CONDITIONS COMPARED.

J. DRYSDALE.

THE proper feeding of the dairy cow is one of the most important problems before the milk-producer. When in Australia recently I had a good opportunity of studying Australian methods and comparing these with those in practice in this country.

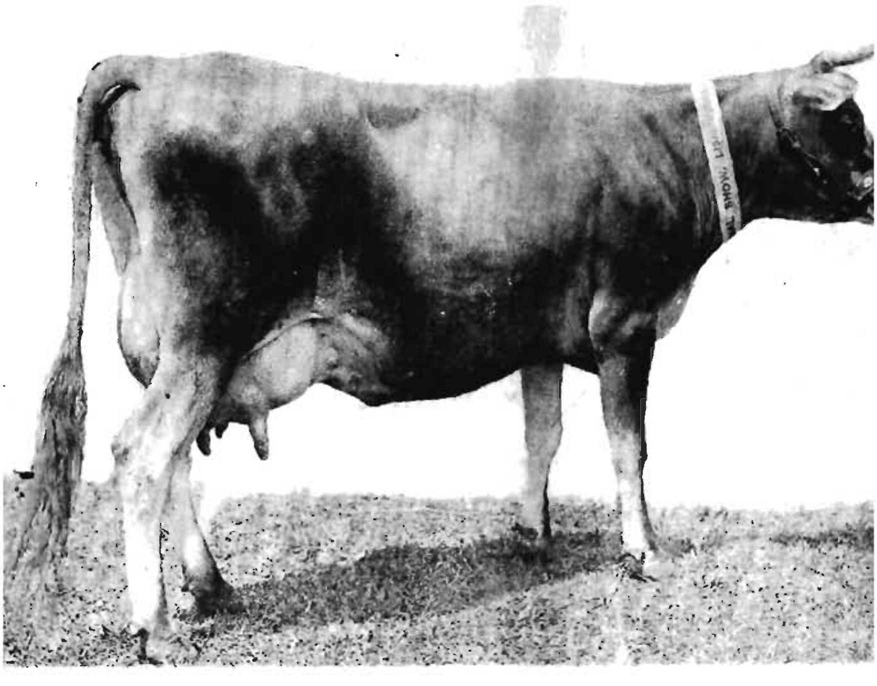
The first thing to attract my attention on Commonwealth dairy farms was that increasing attention was being given to the making of silage, farmers being given every encouragement by the Victorian, New South Wales, and Queensland Governments to adopt this principle of food-conservation. Silage is certainly a most important factor in successful dairying operations on the other side. Farmers are realizing this fact. They are passing beyond the stacking stage, and are largely employing the American method of chaffing material and preserving it in stave silos, which are filled by means of a blower attached to the chaffcutter. This style is found to be cheaper and more convenient in the end. A larger amount of succulent feeding material can thus be stored away. The silo is necessary in Australia because of climatic conditions, which generally mean an abnormal growth of grass and fodder-plants at certain seasons of the year and more or less long intervening dry spells. Thus it is only through silage that milking-stock can be provided with the necessary succulent food for any lengthened period. In this country it is rather different. Here green crops can be grown in practically any summer, and thus, under a proper scheme of management, ideal milk-forming foods are available at all times.

In no case did I see root crops grown for dairy stock, which have to depend on the natural grasses supplemented by silage and hay. In some cases Australian dairy-farmers are taking a leaf out of New Zealand's book and are growing maize for feeding in a green state, but this is only in favoured localities. Paspalum is the dominant grass in the great north coast dairy country, and in the peculiar moist environment it flourishes in an amazing manner. It is hardly probable, however, that it can give the same feeding-value as a pasturage of English grasses. I noticed that the paspalum in the autumn caused considerable trouble by reason of the seed-stalks getting up into the nostrils of the cattle. A whole herd would

be seen to be breathing very heavily, as though the cows were affect(with *tuberculosis*. The seed gets right into the nostril, causing irritatic and subsequent inflammation, and thereby necessitating the animal breat ing through the mouth. In many cases the farmers have a peculiar-shap(hook made for the purpose of taking out the seed.

There are sections here and there in New South Wales and Victor where ideal dairying country is to be found; but this advantage is large counterbalanced by the periodic droughts, or more or less frequent spel of dry weather. In the south coast district of New South Wales, lo famed as a dairying country, dairy farms have changed hands at £40 a acre and over; and the land is worth it, especially as the district is co nected with the capital both by rail and water.

Generally speaking, however, the milk-yielding value of Australia dairy-cattle food is not equal to that of this country. In favoured montl it may be, but it is the year's experience that has to be considered, and is here where the New Zealand milk-producer has the advantage.



EZALIA.

: of the New South Wales Jerseys *imported recently* by the Department for the Ruakui mental Farm Herd. After landing in New Zealand, and when eight months in milk. 30 lb. of milk, testing 6 per cent. fat, in the day.

THE WINTER SHOWS.

FEATURES IN THE DISPLAYS OF THE DEPARTMENT.

IN the exhibits being made by the Department at the winter shows th year there are many new things to be observed and studied. The first its big displays was made by the Department at the Auckland Wint Show, which opened on the 21st of last month and closed on the 27th. Tl exhibits which comprised the display will be shown at other winter exhit tions this year, and some account, therefore, of the features of the Aucl land display may serve as a guide to the visitor at forthcoming fixtures.

THE SOYA BEAN.

Among the exhibits from the Tauranga Experimental Farm was an instru tive exhibit in connection with the Soya bean, which is coming into suc prominence in the Old World by reason of its exceptional value as a fodd for stock. A growing plant was shown as well as the beans. Nine varieti are being received from the United States Department of Agricultur These will be tested at Tauranga.

A GOOD VARIETY OF MAIZE.

A new variety of maize received from America and cultivated at Ta ranga was exhibited. Its special advantage is that it matures about si weeks earlier than any other variety so far grown in this country, an advar tage which will be manifest in districts where, owing to late frosts, an consequently short seasons, maize cannot be planted until December.

THE COW-PEA.

Another interesting exhibit from the Tauranga Farm was that in connec tion with the cow-pea. This is really a member of the bean family. It i being largely used in the central and southern States of America, where i is highly spoken of as a food for stock and a soil-renovator. The American also make use of it for hay.

A NEW APPLE.

In connection with its commercial collection of apples the Orchard Gardens, and Apiaries Division is exhibiting a very interesting specime of a late apple, which presents excellent qualities from a market view point. It is a variety grown by Mr. Charles McLiver, of the Thames Valley

who found the tree in his orchard when he purchased the property some twenty years ago. He has named the apple "American Wine Sap." This is not a new name, but was chosen as the apple more closely resembled the American Wine Sap variety than any other apple, and it is still doubtful if it is distinct from that variety. Its special qualities are that it is a late apple, of excellent colour, and one of the best keepers known in the north. Besides, the apple is of a type most suitable for export. The dominant feature of the apple, however, is its remarkable keeping qualities. The fruit has also been found to be apparently immune to the common troubles of apples. While, however, it is not absolutely blight-proof, it is but slightly affected by the woolly-aphis trouble, and bitter-pit has yet to be discovered in the fruit from the twenty trees in cultivation in Mr. McLiver's orchard. The apple, by the way, is a very heavy and constant bearer.

NATIVE GRASSES.

There was no more instructive exhibit than a collection of the native grasses, shown growing in pots, and displayed with sheaves of each variety, in order to illustrate the growth-form and the seed-stalks, to thereby provide a complete key to identification. The collection, cultivation, and exhibition of native grasses is receiving very special attention in view of the Department's recognition that the grassing of the so-called poor lands is a pressing problem.

A FINE POTATO.

In the Ruakura Farm's big array of specimens from the potato variety plots of this season is a striking tuber (the Princess Victoria) which has not only given the best yield of all the two hundred varieties tested, but has proved a good blight-resister. The seed was obtained from the South. The yield was equal to 13 tons 4 cwt. to the acre, which, considering the very dry nature of the season, is a fine return. The tuber is a kidney white, even in conformation, has shallow eyes, and with a slightly netted skin. The haulm has the desirable upright growth, a habit which facilitates cultivation and spraying. Princess Victoria is an excellent cooker.

CHUNK HONEY.

A novelty included in the honey exhibits was an illustration of a method of marketing honey, which, owing to its peculiar character, has never before been capable of being marketed. It is known as "chunk" honey. In the early part of each season there is a variable quantity of honey gathered which is of too dense a nature to be extracted from the combs in the usual manner, therefore it is almost useless. Mr. Isaac Hopkins, who is now adviser to the State apiaries, conceived the idea of cutting up such combs into small "chunks" of about 1½ in. square, packing them in layers in ordinary 10 lb. tins, and filling the interstices with liquid honey, as an

Auckland Winter Show. A Section of the Department's Display.

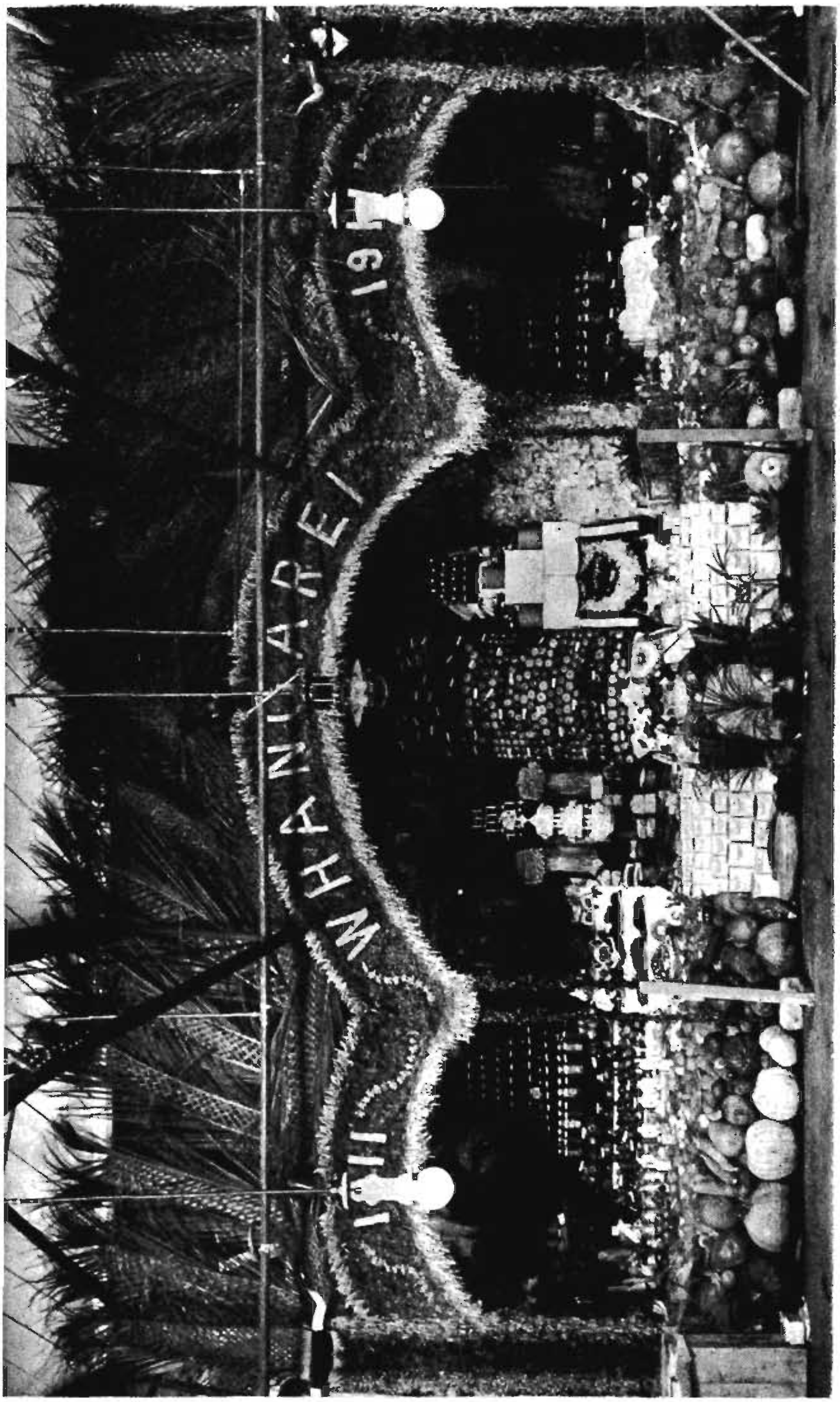
experiment to test the market. Only a small quantity of "chunk" honey has been prepared this season, and if there is a demand for it, which there is likely to be, not only will the Government apiaries put up a good quantity next season, but they will have discovered a means whereby bee-farmers may secure a market for their thick honey. The honey itself is of fine flavour, and the only fault against it, so far as the bee-keeper is concerned, is that he has to cut up his combs, which are of greater value to him, pound for pound, than the honey they contain.

A New Oat.

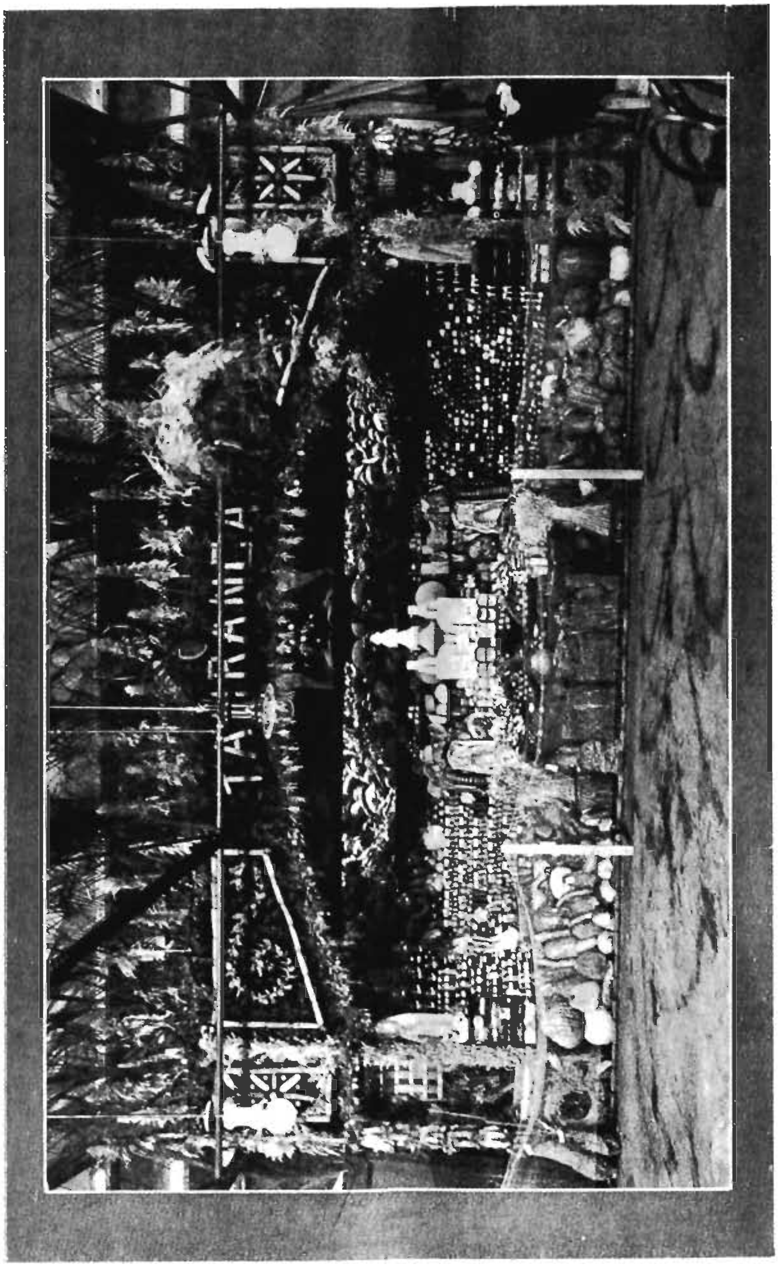
An interesting demonstration of the work of seed-selection being carried out at the Ruakura Experimental Farm by the Horticulturist, Mr. A. W. Green, is provided in a seedling oat bred from a single selected head of the Argentine variety, which stood out for its robust character. The main object of the work of selection was to secure a rust-resistant oat, and apparently this object has been achieved. For two seasons the new oat has withstood rust under most adverse conditions. On either side of it an oat very susceptible to rust (Tartar King) was grown, and though this was badly affected and the wind carried the rust-spores so that they covered the plants of the new oat, yet throughout this severe test it remained quite unaffected. The methods of selection that are being adopted at the State farms follow very closely those of Dr. Nilsson, of the famous Svalof Station of Sweden, in contradistinction to hybridization and the ordinary German and English methods of attempting seed-and-plant improvement by what is known as "continuous selection." The Svalof method, in reality, consists merely of sorting out the various varieties that are included under one general term, such as "Algerian oat," which in itself is not a distinct entity, but a conception including a number of forms differing from one another, and which possess different characters. Thus, it will be seen that the main feature of the Svalof method is to commence work with pure types which will breed true from seed. It is this proved-successful principle which the stations of the Department are following. Hybridization will, of course, follow when the various races of each species have been separated.

Special Grasses.

In the pot-specimens of grasses, of which a most interesting collection is made, was shown a plant of twitch (*Agropyron repens*), one of our worst weeds of cultivated ground, but which is likely, owing to its deep-rooting, frost-resistant, and extremely persistent characters, to prove of value in high country of poor non-ploughable character, such as some of the pumice lands of the North Island and the denuded areas of the South Island, the regrassing of which forms one of our most difficult problems.



Auckland Winter Show. The Winning County Exhibit—Whangarei.



AUCKLAND WINTER SHOW. THE SECOND PRIZE, COUNTY EXHIBIT—TAURANGA.

Another specimen of the same family exhibited. *Agropyron pectinatum*, a native of Australia, is of special interest, owing to the fact that it is the only grass that is naturally reasserting itself on dry, sunbaked faces in depleted southern country.

Special interest was taken in the exhibits of grasses which present features appealing to those concerned in the grassing of the gum lands of the North- *Phalaris commutata* (= *bulbosa*), *Paspalum* (*dilatatum* and *virgatum*), Waipu brown-top (*Agrostis canina*) and Matakana red-top (*Agrostis vulgaris*), all being imported grasses and presenting characters which promise to render them of value for cultivation under poor plant-food conditions.

Co-operative Grain Experiments.

A particularly instructive lesson to grain-growers is contained in well-displayed specimens illustrative of the results of several co-operative field experiments conducted by southern farmers in conjunction with the Department. The specimen sheaves represent the produce from an average square yard of each of the experimental plots. Thus, the merits or demerits of the several varieties are strikingly demonstrated. The lessons of this season are specially valuable, by reason of the drought and semi-arid conditions, in combination with drying winds, prevailing during the course of the experiments. An oat introduced by the Department, Triumph, has palpably given the best result, both in grain and straw. Algerian, which in the north is so much in favour, was badly shaken, and the specimen is one of the poorest in the collection. In the wheat-tests the old solid-straw Tuscan variety, which has been despised by some millers, came out as one of the best as to yield of grain, while the lauded French varieties, Bordier and De Noe, were badly shaken, and make a poor showing against the established varieties by reason of failure of the heads to fill, shaking out, and susceptibility to smut. Velvet Chaff, Pearl, and Red Chaff, in addition to Tuscan, have demonstrated their value under adverse conditions. All the specimens are displayed in such a manner that the full benefit of the lessons they convey may be derived by farmers interested in grain-growing.

Perhaps the most comprehensive display in the exhibit is that in connection with roots--mangels and turnips—principally illustrative of co-operative experimental work. The exhibits demonstrate the value of varieties in varying conditions of soil and climate, as well as susceptibility to disease. In all there are exhibited twenty varieties of mangels, twenty-six of swede turnips, and twenty-eight of yellow- and white-fleshed. The exhibits were not selected by reason of their size, but as the most typical, and therefore the most valuable, of the respective varieties. The mangels are from Sunnyside Mental Hospital, the swedes from Mr. J. Smith's farm, Stirling (Otago), and the yellow- and white-fleshed turnips from Mr. R. Houliston, Kakapuaka (Otago).

At Palmerston North and later shows there will be exhibited specimens of the improved broad-leaf silver-beet from crops grown in the South, with the object of testing this plant as a substitute for turnips in the feeding of sheep, for which purpose it has been cultivated by itself, and in combination with rape. In both cases it is said to have given excellent results.

AUCKLAND WINTER SHOW. A CORNER OF THE DEPARTMENT'S DISPLAY.

ANALYSES OF SOILS, AND ADVICE ON MANURIAL TREATMENT.

The Department of Agriculture is prepared to analyse soils for farmers, and to supply advice as to the best manurial treatment. It would appear that this is not generally known, as few applications are received for such information. Forms setting out the proper procedure in applying for such information may be obtained from the Director of Fields and Experimental Farms, Department of Agriculture, Wellington.

The following directions are published for general information :-

Directions to Applicants.

If advice is sought concerning land already under or to be put under fruit, vegetables, or vines, this form should be sent to the Director of Orchards, Gardens, and Apiaries, Department of Agriculture, Commerce, and Tourists, Wellington. If advice is desired concerning land under or to be put under field-crops or grass, this form should be sent to the Director of Fields and Experimental Farms, Department of Agriculture, Commerce, and Tourists, Wellington.

On receipt of the form it may be found that advice can be given without the necessity of a sample of the soil being analysed. Should, however, an analysis be necessary, directions as to the best method of taking the sample will be sent to the applicant.

No sample of soil should be sent unless at the request of a departmental officer.

Any such samples as may be required must be forwarded, carriage paid, by the applicant.

It is requested that applicants forward from time to time information as to the results of the treatment recommended by the Department.

DEPARTMENT'S OFFICIAL BADGE.

The accompanying block illustrates an official badge, to be worn in the lapel of the coat when officers of the Department of Agriculture, Commerce, and Tourists are attending agricultural shows, so that visiting farmers may be able to identify representatives of the Department.

THE FARM GARDEN.

PEA - CULTURE.

W. H. TAYLOR.

THE successful cultivation of peas demands a soil rich in humus. It is essentially a moisture-loving plant, as is abundantly proved by the fact that those crops maturing in the early part of the season are invariably the best. To maintain a supply for the table a sowing is made at intervals of a fortnight for a certain number of months. The first and second sowings are always the most prolific in bearing; after that each crop diminishes in quantity according to the state of the soil, and if it be very dry the falling-off is serious in extent. Deep tilling, with plenty of humus below, frequent stirring of the surface soil, or, better, a mulch of stable litter, are the only means by which a good crop can be secured from seed sown after hot weather sets in.

TIME TO SOW.

The farmer usually sows but one crop each season, growing what are known as "field peas," generally Prussian Blue or Partridge peas. These should be got in by the middle of September, or even earlier, but not much earlier, as ripening should take place when dry weather can be reckoned on, in February or March.

For table use the first sowing is usually made in May, towards the end of the month, a dwarf variety being used. This latter is doubtful wisdom in many cases. The dwarf, as it lies on the soil, may certainly be expected to mature earlier than a tall variety supported by sticks, but if slugs are abundant it is next to impossible to save the peas from their ravages; whereas the tall variety, supported by sticks, is easily protected, and, if a little later, will be more likely to produce a remunerative crop. After the sowing just mentioned a considerable time passes before the next sowing, for it is useless to sow during winter. Sowing for practical purposes commences at different times in different places, being ruled by the condition of the soil. In most places the 1st July is the time to begin the regular sowings. At that time two varieties should be sown, a dwarf and a tall. In places where it is right to sow at that date the peas from the dwarf sort should begin to come into use during the second week in November, and those from the taller kind should come in before the dwarfs are over. If circumstances have been favourable the autumn-sown lot should come into use about the last week in October, and hold on till the spring-sown are well in crop. Fol-

lowing the 1st July sowing a lot is put in about every fortnight, the usual custom being to sow again as soon as those last sown are well through the soil. This bi-monthly sowing is continued till January, the first week in which month sees the last lot put in. By the end of March the practical end of the supply is reached: any coming after that time are mere catch lots.

METHOD OF PLANTING.

Peas grown for table should be of as good quality as possible. Therefore they should not be crowded, either by sowing rows too close together or by placing the seed too thickly in the drills. In this matter the habit of the variety should be considered. Very tall kinds, 6 ft. high or more, are seldom grown in New Zealand because of the cost of sticking. Most of such sorts branch freely, and seed should be placed singly about 6 in. apart. But the intermediate sorts usually grown do not branch, or only to a slight extent, and a well-furnished row demands closer sowing. A pint of seed should be used to 40 ft. of drill. For varieties expected to grow 30 in. high, drills should be 3 ft. asunder. Wherever possible sticks should be used. It pays, because tilling is made easier and can be better done, the plants are more robust when kept from the soil, slugs are no trouble, the crop is greatly increased and is easier gathered, and the quality of the peas is vastly improved. Garden crops are always greatly benefited by a liberal dusting of soot, scattered over the seed before covering up with soil. If the soil has not been well manured a little bonemeal may be added to the soot.

VARIETIES RECOMMENDED.

The best early dwarfs I have grown are Sutton's Little Marvel, Carter's Springtide, Daybreak, American Wonder: their merit being in the order written. Lord Kitchener and Wonder of the World are the quickest sorts, but are poor croppers. Of the taller sorts Dr. Sharpe is the finest-flavoured I have grown, Star of Australia being about equal. As a variety for general use, on account of its compact growth, consistent heavy bearing, fine pods, and large peas of good flavour, Sutton's Dwarf Defiance is to be recommended. This variety quite supersedes the old favourite Veitch's Perfection, or Yorkshire Hero, as it is often called.

HOME-SAVED SEED.

The practice of saving seed at home is to be highly commended, because if carried out in an intelligent manner it improves the breed and tends to the introduction of better forms. When seed is to be saved, leave a row, or part of a row, to ripen; go over from time to time, and gather for use all except the largest pods; and when these are ripe open each pod separately, and keep the seed only from pods containing a maximum number of peas. Several years' saving in this way will be sure to produce an exceptionally fine strain.

THE HEMP INDUSTRY.

MARKET KNOWLEDGE OF FINE GRADE REQUIRED.

W. H. FERRIS.

A FEATURE of the hemp industry, which may be well to explain, in view of the little knowledge possessed by the general public of the value of the Australian market to millers of phormium-fibre, is that the market values of New Zealand hemp which appear in the daily Press do not give the true indication of the commercial position. For instance, practically the only grades exported to British markets are good-fair and the lower qualities, and thus it is entirely on the values of these that the market value of our hemp is estimated and advertised to the world. On the other hand, Australian and local cordage-manufacturers take all the high-point good-fair and fine hemp produced in the Dominion, and have done so for years. Therefore, the higher values obtained for these are never recorded in the market quotations of hemp which are made public. During the present season, when at certain periods the milling of the qualities taken by the British trade have shown little or no profit, the higher grades taken by Australian and New Zealand buyers have returned millers fairly satisfactory values at all times, though, of course, it is only those millers who have adopted the latest methods and are working under favourable conditions who can take advantage of the market for the higher grades. Thus, it will be seen that an incorrect conception of the position of the industry exists among those who depend for their information as to the state of the market value of phormium-fibre on London cables. It has been suggested that the High Commissioner should be asked to include quotations for fine fibre in his weekly market cable; but this he obviously cannot do, as the fine grade is practically unknown in Britain. It would be an excellent idea were millers to combine in the shipping of a large parcel of high-point good-fair and fine grades of hemp to Britain, in order to test the Home market. It is not improbable that could British and Continental cordage people have an opportunity of testing our better-quality fibre they would discover in it an article valuable for special purposes. This would obviously have a far-reaching effect on the position of the industry.

Probably, owing to the weaker market position of good-fair hemp, some millers, who have been consistently turning out this quality, have gone back in their work, and have forwarded to the grading-stores a poor-quality hemp. It should be unnecessary to emphasize that uniformity

in the quality of a brand is essential to the establishment of a good connection for it.

There has been no noticeable improvement in the quality of hemp reaching the grading-stores during the past month.

Tow is still a very payable commodity, and millers would find it much more profitable were they to take more care in its preparation. Much of it has to be reduced in grade owing to the presence of dust and rubbish, the result of poor shaking.

STOCK EXPORTED.

MAY, 1911.

Port of Shipment.	Horses.		Cattle.		Sheep.		Swine.	Donkeys
	To Australia.	To Pacific Islands.	To Australia.	To Pacific Islands.	To Australia.	To Pacific Islands.	To Pacific Islands.	To Samoa.
Auckland ..	44	4	5	17	..	83	28	12
Gisborne ..	7	..	..	..	..	..	..	..
Wellington ..	117	..	..	..	115	..	..	..
Lyttelton ..	74	..	..	..	73	..	..	..
Dunedin ..	187	..	..	..	..	..	..	..
Bluff ..	116	..	..	..	..	..	..	..
Totals ..	545	4	5	17	188	83	28	12

The following are particulars of the horses shipped: 522 draughts (41 stallions, 370 mares, and 111 geldings); 6 thoroughbreds (3 mares and 3 geldings); 18 hackneys (1 stallion, 10 mares, and 7 geldings); 3 ponies (1 mare and 2 geldings).

THE WOOL-EXPORT.

THE following table, prepared by Messrs. Dalgety and Co., shows the export of wool from the Dominion during the month of May:—

Towns.	May, 1911.	Total for Eleven Months.	Corresponding Eleven Months of 1910.
	Bales.	Bales.	Bales.
Invercargill	3,109	27,141	27,856
Dunedin	1,501	35,094	39,347
Oamaru	..	7,801	8,248
Timaru	3,234	34,470	33,938
Christchurch	9,987	84,468	87,885
Blenheim	983	14,166	9,222
Nelson	61	3,149	3,692
Wellington	3,094	113,406	120,345
Wanganui	187	21,716	19,565
Waitara	..	6,706	4,498
Napier	2,150	62,347	77,677
Gisborne	430	40,126	41,401
Auckland	780	24,433	23,722
	25,516	475,023	497,396

THE WELLINGTON INDUSTRIAL EXHIBITION. THE DEPARTMENT'S HEMP TROPHY.

THE APIARY.

NOTES FOR JULY.

I. Hopkins.

The management of the apiary during July consists chiefly in taking an occasional round among the hives to see whether anything has gone wrong with them. On no account should they be unnecessarily meddled with. In the event of an Apiary Inspector coming round, he will, of course, require, in the interest of the industry, to examine a few hives to ascertain the condition of the combs, whether diseased or not. This is a necessity, and need not be harmful when done with despatch.

Dry Mats.

It is well to examine the mats over the frames occasionally, especially after heavy rains, and to remove any that may have got damp, to be replaced at once by dry ones, of which a supply should always be on hand. It will only be necessary to gently lift one end of the cover to discover the condition of the mats: it can be done without disturbing a bee.

Leaky Covers.

Any covers that are not absolutely rainproof should be seen to at once. Give them a good thick coat of paint, and while wet lay on neatly a covering of cheese-cloth, and paint over that. This treatment will make the cover waterproof for many years.

Removing Spare Top Boxes.

All top boxes that have not yet been removed should be taken off during the first half of the month, and the bees be confined to the brood-chamber. Breeding will commence in colonies of normal strength about the end of the month, and the hives should be made snug with well-fitting mats to conserve the heat of the hive. In cases where the bees have taken to the top box entirely, remove the lower one, and put the former in its place.

Ventilation.

Many beginners think that it is necessary to allow but a very small entrance to the hives in winter, under the impression that by doing so they

are keeping the interior warmer. It is a great mistake, and causes dampness within and mouldy combs. All the ventilation of the hive is conducted by the bees through the entrance, and a large one of 8 in. or 10 in. is required in winter to allow the bees to drive out the excess of moisture.

Decide on what you intend to do in the coming season, and prepare for it.

TESTING SUSPECTED BEESWAX.

ISAAC HOPKINS.

MAY I suggest a very simple test for the usual adulterants in beeswax —viz., the ordinary commercial paraffins and cerosins—a test which I often used myself when handling tons of wax from all sources.

Melt separately a little beeswax of known purity, and some of the suspected wax. Drop a very small portion of each on to a piece of glass: this is to get rid of any slight hollow or cavity in the wax in which air could lodge. Next, pour a little clean water into a small clear-glass bottle; drop the piece of pure wax into it: the specific gravity of the wax being less than the water, it will float. Now pour in slowly some pure alcohol till the wax slowly sinks to and touches the bottom; then drop in the suspected piece. If it does not sink slowly like the pure wax there will be good reason for believing it to be adulterated. If there is more than 5 per cent. of either of the two adulterants present the stuff will float, while the pure wax lies at the bottom of the liquid. If this test indicates adulteration, then it is best to hand the stuff over to an analyst to obtain exact memoranda.

HOME INSPECTION OF DAIRY-PRODUCE.

THE Hon. T. Mackenzie, Minister of Agriculture, having approved the location of an officer of the Dairy Produce Division on the British market in order to further advance the work of controlling the quality of New Zealand butter and cheese, Mr. W. E. Gwillim has been appointed to the position. Mr. Gwillim is one of the most valuable members of the Division he is to represent at Home. For some years he has been Grader-in-charge at Wellington, and at the same time carried out special duties of importance for the Department. Mr. Gwillim will take up his new work at the commencement of the forthcoming season.

TO SUBSCRIBERS.

THE subscription of a large number of readers ended with the May issue. A notice of renewal is being included in their copies of the present number. Should these subscribers desire to continue their support of the *Journal* (and it may be assumed there will be no refusal) they should notify the Editor at once, and forward the annual subscription of 2s. 6d. It may be pointed out that by subscribing to the *Journal* by the year the actual price of each copy is only 2d.

POULTRY-KEEPING.

F. C. BROWN.

THE REAL TEST.

IN taking egg-laying records as a basis on which to estimate the egg-yielding power of a breed many people are making the very common mistake of taking the gross yield as the determining factor. With eggs, where freshness of the product is of paramount importance, it is not the number laid in the year that furnishes the true guide, it is the actual value returned, and, better still, the net profit secured. There can be no comparison between a bird laying the bulk of her eggs during the dear season and one producing her main yield in the cheap season, when any sort of a fowl will lay. Success in poultry-keeping depends upon the manner in which its many details are attended to, but there is one detail before all others which must be always kept in view: this is economy of production, or having everything arranged in such a manner that the actual cost of each egg produced or each bird reared is known to a nicety. Of course, it is now generally recognized—in fact, it has become an established maxim—that eggs must be produced in the dear season if the business is to be made really profitable. This is, after all, only what producers of other primary products (especially in catering to an oversea trade) aim to secure all the time. It is the great problem before New Zealand poultrymen. Its solution is within sight, but the riddle will never be solved by interference with nature, or the adoption of patent ideas of making hens lay when they do not want to. Eggs in winter can be produced without fail by following rules which, in the hands of experienced men, are simple and easily effective. In the first place, the winter layers must be pullets bred at the right time and managed in the right way, though the importance of using nothing but pullets applies more to Leghorns than to the heavier breeds. Artificial incubation and brooding have passed the experimental stage, and no difficulty is now presented in providing sufficient pullets each year to insure a big supply of eggs in the dear season. At the end of the pullet's laying period sentiment should not be allowed to interfere with the work of culling. The poultryman who is really anxious to secure the greatest profit from his undertaking will, however, not even leave culling to the end of the first laying season; he will cull all the time. To repeat: it is not the number of birds kept that determines success,

but the profit secured; and every drone retained in the flock reduces the profits being made by those doing their duty. Culling may even commence during the first months of maturity, for it is useless expecting a poor-constitutioned bird to make a profitable layer; and, again, there are always freaks or throwbacks from the best matings, which will never develop into satisfactory stock. Ability to judge on form is imperative at this stage, for where a man possesses the necessary keenness of eye to pick out the bird not constructed on egg-producing lines he is in a position to weed out the drones, save his feed-bill, and thereby increase the profits from the payable layers. Readers would do well to study the notes on selecting the layer according to form which appeared in the December issue of the *Journal.* The thing to remember is that it is never profitable to keep any bird which does not promise to return a good net profit.

Breeding.

A large degree of success in building up a flock depends not only on having the right type of bird in the breeding-pen, but on the proper management of the pen from the start. A common mistake is to put the male birds with the hens just about the time the eggs are required for hatching purposes. The rooster should have female company for some time before. Then when he is put in with the breeders more uniform and satisfactory fertility will result. Breeding-birds should not be kept in too confined a space prior to mating. A good range and a liberal supply of green food is conducive to virility and prepotency. If the most vigorous stock is desired—and this should be the aim of any utility breeder—a good key to the position is to note the hens the rooster prefers, an indication of which is afforded by the condition of the saddle of the hen. If this is cut about it proves that the bird is one specially selected by her mate, and a demonstration is thus provided of the best guide to breeding power—nature's selection. This principle is all the more strongly emphasized when there are two cockerels, or even more, running with a big pen, when the most desirable hens from a breeding point of view will be monopolized by the strongest male bird. It is such hens which should be chosen for the breeding-pen of the following season. Nature, after all, is the best guide we have. In-breeding apparently does not trouble rabbits and sparrows. Nature provides for elimination of the unfit. Constitution is maintained without the necessity of importing blood, and with no assistance from man these pests multiply with amazing rapidity.

Of course, constitution is not everything, but without constitution it is useless attempting to develop a desired type. It is one thing attaining an ideal and quite another thing maintaining it. For instance, it would be a mistake selecting a bird solely on constitutional points. These must be accompanied by those characters it is desired to develop. In advancing

egg-yielding power, however, the hens which attract the male most forcibly are invariably the best breeders, and therefore (if of a laying strain) will be the heaviest producers. On the other hand, a bird of ideal laying type is useless if it does not possess the desired constitution, as it will then not be able to maintain its laying power for any lengthened period.

A striking illustration of the type of bird desired where egg-production is the objective is to be seen at the close of an egg-laying competition, and to the student of egg form no education would provide the same practical guide. Those in the running at the end are practically all of one type, having an oblong tapering body, broad and deep behind, and running to a fine neck carrying a clean alert head, with fine-boned legs, set well to the rear and wide apart, the feathering being tight all over, or what is known as "hard" feather, while the birds bear every indication of laying-power and the ability to maintain it to the end. They look full of life, even the worn-down tail having little effect on the strong appearance. Perhaps the best point about these birds fighting out the finish is that they have been too busy to moult, having come through the natural resting period with merely dropping a few feathers. The weak pens, on the other hand, have gone through their moult, and have their new plumage. The mere fact of the leading pens laying so late into the autumn means that they will be at it again as soon as those which have moulted. Another point: The tail of the heavy producer is carried high, and is more of a fan-shaped than a "whip" tail. I can imagine no better means of acquiring the finer points in selecting on laying form than a visit to a laying competition during its final stage.

In selecting birds for breeding-pens as well as for egg-laying competitions very few breeders are working on a definite plan. The only sound principle is to commence with a knowledge of the laying-power of the dam of the sire as well as that of the dam herself. Haphazard mating will sometimes produce a good uniform pen, but how many can expect a success obtained under such circumstances? The men who consistently succeed know just what they are doing. Their breeding-pens are headed by sires with a laying pedigree, and the egg-record of the dam of every hen is known. Of course, even under such circumstances culling is necessary, especially to maintain constitution. Such breeders laugh at secret tests. They know just where they stand, and can rely on results. No one will deny the unique success of Padman, the South Australian breeder, with utility White Leghorns, and yet he says he could not get a lead-pencil between the pelvic bones of his cockerels.

THE UTILITY BIRD.

A common mistake is to suppose that because a bird is built on utility lines it cannot be a good specimen of the breed it represents. There is no

more stupid fallacy. It is granted, of course, that the extreme fancy type of bird, in which everything has been subordinated to fancy characters, has little or no utility value. Admirers of these monstrosities have yet to prove, however, that they are more true to the English show standard, which up to the present has governed the judging of poultry, than are many birds which conform to the desired utility type. Taking the pictures in Lewis Wright's standard work on poultry as a guide, it is very easy to prove that typical specimens of the breeds introduced from England are true specimens, although being of the type most desired by commercial poultry-keepers. The cause of the exaggerated specimens too often seen in show pens is not so much the fault of the standard as the fault of the men who endeavour to interpret it. It is an unfortunate tendency in poultry, as indeed in many other classes of live-stock, as well as in produce in general, for judges to be influenced unduly by the size of the specimen before them, quite overlooking the fact that quality is the more important consideration.

SECRET TESTS.

There are still many poultrymen who regard the pelvic-bone test, or local variations of it, as an infallible guide to the egg-laying power of a bird; in fact, so firmly do some poultrymen adhere to this alleged guide to laying-capacity that they discard even performance, and certainly type, in selecting their breeding-stock. There is some excuse, perhaps, for those who have not trapped their birds to be led away by advocates of the "systems." For instance, a man may have a special pen of twenty birds from which he intends to choose his breeders. He is getting, say, ten eggs per day, but he does not know exactly which of the birds are producing them. An agent of a system, full of arguments to push a sale, happens along, or it may be the advocate is merely a fellow-breeder who has purchased the system and still retains confidence in it. Here, thinks the poultrymen, is just the opportunity to discover which of the ten birds are the layers, and he receives the apostle of the system with open arms. The visitor goes through the birds and at once picks out the layers. He can do this practically with his eyes shut, for naturally the birds laying at that particular time have their pelvic bones well separated, while the birds not laying have their pelvic bones in their natural position, and, for this reason, are in many cases wrongfully classed as drones, though some of them may be the best layers in the flock. The position is that a certain bird examined on a certain day may meet all the requirements of the system, whereas at an earlier or later examination may be definitely classed as a waster. The width of the pelvic bones is, as a matter of fact, merely an indication of when a bird is laying. The best layer in the flock may be examined just as she has commenced a moulting or broody period, when

the width of the bones will within a few days contract to the non-laying width. I have seen a Silver Wyandotte, a large useless specimen which did not lay enough eggs to pay for the cost of feed, with a width which would easily take four fingers, while at the same time I have known another bird of the same breed and flock which would not take two fingers at laying time and yet laid, on trap-nesting, over two hundred eggs in the season. The bloom on the bird's comb goes hand in hand with the pelvic-bone indication; as the former reddens the latter widens. The most arrant "waster" in the yard will at certain periods have a bright comb indicative of laying condition, and if the pelvic-bone system is then applied she will be credited with a power she does not possess. A fair test of the system would be to apply it when the combs are dull. As a guide to the annual laying-capacity of a bird the width of the pelvic bones is on all-fours with the condition of the comb. Just as the bones are more or less wide apart when a bird is laying, so the comb is brighter at the same period.

Of course, there is less variation with the male, and what variation does take place is influenced by the condition of the bird. Many a good strain has been destroyed, from an egg-laying view-point, simply by reason of the sire's quality being determined according to the pelvic-bone myth. After all, the chief guide to laying-power is the abdominal capacity combined with constitutional points. Where these are present to the desired development the other indications of the layer enumerated above follow as a matter of course.

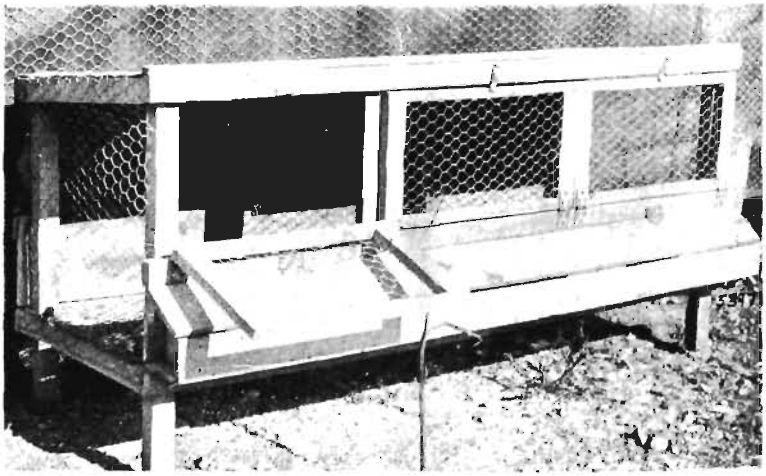
BE PREPARED.

Those who have not commenced hatching and brooding operations are reminded that dirt, which is almost invariably accompanied by insect life, must find no resting-place about an incubator or brooder. It is not sufficient that these should be clean to the eye; they should be clean to the microscope, and clean where an examination is impossible—in the cracks and crevices. Many people have really no idea what cleanliness means. They are satisfied if a things looks clean; and what looks clean to some people would suggest that they view their work through coloured spectacles. The point to remember is that the main object of cleansing operations on a poultry plant is to fight vermin and other undesirable forms of insect life, and that where to the eye (which is a most deceptive organ at times) the spot is clean it may harbour myriads of microscopic germs or their spores. There must be no half-measures in this work; it must be thorough, and the more thorough the better. To properly clean an incubator there is nothing better than a strong solution of sheep-dip. The brooder presents a more difficult problem. Sheep-dip sprayed into every corner and crevice of the brooder-box is the first essential; clean bedding should be provided, straw chaff being the most suitable material; it will pay to provide new curtains each year; the inside runs should be

made sweet, and the outside runs should have a sole of young grass and clover (preferably white). Shade in the runs is necessary, in order that when the weather is hot the young ones may have protection from the heat and obtain the full benefit of the fresh air, being thereby discouraged from running into the brooder-house to escape the strong rays of the sun. During the past season I met with innumerable cases of loss of chickens solely due to head-lice, and in no case was the owner aware of the cause of the trouble. Needless to say, where the losses occurred the conditions of the plant were anything but sanitary, chiefly due to overcrowding. Prevention is the only safe way of combating this trouble, and the chief preventive measure is cleanliness. There is a cure, but it must be carefully applied. This is lightly rubbing the head with a mixture of equal parts of lard and sulphur, using only a very small quantity. If too much is applied the treatment is apt to be more harmful than beneficial, as if there is too much lard the heat of the sun will make this run over the face and eyes, which will then become scalded.

So attractive did the display of utility poultry in the Department's exhibit at the Auckland Show prove that it has been decided to extend this at future winter exhibitions.

Mr. T. W. Lonsdale, who has been transferred from the management of Ruakura Experimental Farm to that of the Moumahaki Farm of the Department, has been presented by his old staff with a memento of his connection with Ruakura—a gold albert and pendant. Mrs. Lonsdale was presented at the same time with a gold brooch.



A GOOD STYLE OF BROODY COOP.

ANSWERS TO CORRESPONDENTS.

ORCHARD-PLANTING. IN-BREEDING.

C. R., Nelson.—Your request for information in regard to the planting of an orchard will be fully dealt with in next month's *Journal*. The Director of Live-stock and Meat supplies the following reply to your later query on the subject of in-breeding :—

I do not know of any table on in-breeding as applied to cattle, pigs, and sheep. A certain amount of what might be termed "close breeding" is always necessary if a definite type is desired. Breeding from too nearly related animals is generally disastrous. The only book I know which might be of use to you is "Animal Breeding," edited by Thomas Shaw, Professor of Animal Industry, University Minnesota, U.S.A., and published by the Orange, Judd, Co., New York and Chicago. This work was published in 1909, the price being about 7s. or 8s. It could be procured from any of the large booksellers.

TAILING AND CASTRATING OF LAMBS.

S. C. L. McC., Coromandel.—An article on tailing and castrating of lambs will appear in the July issue.

BLIGHT IN PEACHES.

J. S., Mosstown, Wanganui, writes,—

Peaches have been doing very well with me lately, but these last two seasons the leaves of several trees have turned a silvery appearance for a few days, and then they have fallen off, and the fruit does not develop. As we lost heavily through it last season, we wish to know if anything can be done to prevent its recurrence next season.

The Director of Orchards, Gardens, and Apiaries replies,—

Judging by the description, I should say the trees have been attacked by silver-blight, but it is impossible to state positively without seeing specimens. In any case it will be wise to give the trees a dressing of from ½ lb. to 4 lb. of sulphate of ammonia, according to size and age of tree. The chemical should be sown round the tree in spring, and lightly raked in.

DISEASE IN CALVES.

E. S. T., Ruatangata, Kamo, writes as follows :—

There happens to be a case in this district where a settler has purchased about two hundred weaner calves from his neighbours this season. About twenty-five have already died, and as many more are likely to do so. Upon opening up the carcase the lungs are found to be infested with the lung-worm. Yet the calves were healthy and strong when purchased, and those which the various settlers kept back are still sound and right. Can you suggest a reason and a cure, or anything pertaining to the matter ?

The Live-stock and Meat Division furnishes the following reply :—

There is evidently some other condition besides the lung-worms which is causing the death of the calves, and this in all probability is a parasitic worm in the fourth stomach, known as the *Strongylus contortus*. These are often found in enormous numbers. They are from ½ in. to 1 in. in length, and about the thickness of a pin. Your best plan would be to inform the Inspector of Stock for the district, who will slaughter one of the ailing calves and make a *post mortem* examination. If the settler has not had previous experience the rearing of such a large number is a serious undertaking, and it would appear that either the conditions under which they are kept or their treatment is not satisfactory. This is evident, as it is stated that the calves which the owners kept back are still sound and right.

Lessons on Vine-pruning.

R. J. T., Foxton, writes as follows: -

Would you kindly let me know, through the correspondence column of the next *Journal*, where I could get some practical lessons on vine-pruning, especially in regard to vines growing under glass.

The Director of Orchards, Gardens, and Apiaries replies.-

The Vine and Wine Instructor will call and give instructions as soon as his present engagements are filled.

Curing of Bacon.

A. G. A. C., Bunnythorpe, writes,

Will you kindly furnish me through your *Journal* with a recipe for making a mild-cure bacon by the dry-salting method.

The Director of Live-stock and Meat replies,—

The following recipe is suitable for home-curing a 150 lb. carcase of pork: When the carcase is thoroughly set, cut up, and salt lightly, then lay it upon a clean concrete floor or table overnight. Next morning brush the salt off thoroughly, rub with coarse salt, to which, for each side of bacon, add 6 oz. of saltpetre and 1 lb. of brown sugar. Continue rubbing every day for three weeks, then wash clean, when it will be ready for smoking, the duration of which depends upon the taste of the manufacturer. *Note:* Dry-salting should only be undertaken in cold weather, and in a cool place.

Million-maker Potato.

W. M., Rae's Junction, Tuapeka, writes,—

Would you kindly inform me if seed-potatoes of the Million-maker variety are procurable? If so, please state price. I read an account of them in the last *Journal*.

Mr. W. A. Curtis, Head Teacher, Kakaramea School, Kakaramea, who furnished the report on the potato experiments published in the April number, supplies the following reply:—

I am sorry to state that we have only a few potatoes of the Million-maker variety saved for seed, the rest having been sold. However, if the gentleman interested would like a few pounds for experimental purposes I would be happy to supply him gratis if he forwards the cost of carriage—say, 1s. The seed we had was supplied to the schools by the Wanganui Education Board. I have an idea that Million-makers are to be had from Mr. Burrell, potato-grower, Feilding. The price should be about 2d. per pound.

ARGENTINE TRADE WITH BRITAIN.

The Commerce and Tourists Division of the Department of Agriculture, Commerce, and Tourists has received the following cablegram from Buenos Aires, dated 6th June, 1911:—

The following shipments of produce were despatched from the Argentine to the United Kingdom ports during May, 1911 (compared with May, 1910):—

	1911.	1910.
Frozen beef (quarters)	160,788	157,736
Chilled beef (quarters)	173,569	124,440
Frozen mutton (carcases)	209,533	401,313
Frozen lamb (carcases)	65,749	97,590
Butter (boxes)	Nil	5,393

SHIPMENTS OF UNDERMENTIONED PRODUCE FROM NEW ZEALAND TO UNITED KINGDOM,

COMPILED FROM MANIFESTS OF VESSELS SAILED DURING RESPECTIVE MONTHS OF THE CURRENT AND PRECEDING SEASONS.

Month.		Mutton, Carcases.	Lamb, Carcases.	Beef, Quarters.	Butter, Boxes.	Cheese, Crates.	Wool, Bales.	Wheat, Sacks.	Oats, Sacks.	Rabbits, Crates.	Hemp, Bales.	Tow, Bales.	Kauri-gum, Cases.	Sundry.
October,	1910	49,010	800	10,531	60,014	9,159	3,189	94,815	23,330	36,947	3,632	1,232	3,089	56 carcases pork.
	1909	*103,746*	*49,600*	*4,049*	*57,221*	*13,716*	*3,995*	..	*41,079*	*24,847*	*1,105*	*631*	*7,882*	..
November,	1910	62,926	29,877	5,554	105,759	27,749	55,551	76,594	331	28,646	6,850	2,300	4,339	911 carcases pork.
"	*1909*	*56,467*	*40,973*	*11,073*	*99,951*	*33,019*	*49,480*	..	*21,955*	*26,448*	*4,151*	*734*	*4,383*	..
December,	1910	82,405	157,172	13,155	182,051	67,162	59,080	..	..	9,716	4,524	109	5,363	686 carcases pork.
"	*1909*	*90,245*	*86,345*	*29,199*	*164,314*	*68,867*	*72,056*	..	*2,613*	*2,128*	*7,389*	*1,618*	*8,742*	..
January,	1911	175,337	287,120	13,568	90,405	46,375	127,199	..	16	399	15,234	3,302	7,094	590 carcases pork.
"	*1910*	*86,491*	*252,193*	*22,527*	*87,934*	*89,717*	*122,399*	*2,391*	*15,839*	*1,634*	*11,305*	*4,704*	*5,682*	..
February,	1911	242,090	450,406	24,924	86,368	46,667	70,080	23,694	200	..	4,428	1,302	2,113	1,369 carcases pork.
"	*1910*	*196,093*	*414,408*	*23,798*	*97,766*	*62,192*	*102,182*	*4,724*	*8,600*	..	*4,223*	*2,314*	*4,827*	*1,719* "
March,	1911	264,297	665,822	26,657	45,912	40,668	58,362	40,276	..	..	3,650	1,583	8,982	2,408 carcases pork.
"	*1910*	*222,058*	*413,179*	*22,134*	*77,319*	*42,029*	*64,266*	*2,899*	*3,636*	..	*9,152*	*2,490*	*2,959*	*798* "
April,	1911	172,503	491,413	19,106	14,823	33,411	42,917	38,456	6	..	9,233	1,827	2,577	2,431 carcases pork.
"	*1910*	*209,120*	*559,166*	*29,355*	*46,524*	*44,032*	*32,920*	*21,855*	*1,934*	*12*	*10,179*	*2,951*	*4,250*	*627* "
May,	1911	204,390	377,105	20,173	995	20,732	33,033	93,854	..	..	7,443	1,210	7,720	1,087 carcases pork.
"	*1910*	*310,196*	*622,232*	*38,276*	*9,588*	*28,384*	*25,123*	*81,052*	..	*3,010*	*10,017*	*2,346*	*3,150*	*1,293* "
June,	1910	299,596	555,777	60,286	485	17,963	21,260	13,707	..	8,988	6,180	2,684	7,104	658 carcases pork.
"	*1909*	*108,094*	*302,721*	*29,029*	*6*	*12,406*	*12,157*	*88,974*	*223,563*	*3,500*	*1,768*	*790*	*3,762*	..
July,	1910	249,906	334,753	71,160	..	595	12,816	20,604	1,106	8,649	6,695	1,437	8,272	2,448 carcases pork.
"	*1909*	*164,437*	*231,053*	*31,929*	*1,479*	*3,650*	*22,471*	*77,909*	*170,701*	*5,473*	*4,429*	*633*	*10,260*	..
August,	1910	94,468	97,899	16,440	634	..	5,381	33,970	273	22,629	1,378	720	6,793	362 carcases pork.
	1909	*63,219*	*117,316*	*41,029*	*3,601*	*1,721*	*6,575*	*37,207*	*234,998*	*9,149*	*2,348*	*1,286*	*887*	..

HEMP AND TOW GRADING RETURNS.

MAY, 1911.

Hemp.—The total number of bales graded was 7,777, as compared with 12,002 for the corresponding month of last year, a decrease of 4,225 bales. For the twelve months ending 31st May the number graded was 101,253, as compared with 117,526 for the previous twelve months, or a decrease of 16,273 bales. Worked out on a percentage basis the quantity of each grade dealt with during the month was as follows: Superior, nil; fine, 3·35; good fair, 39·75; fair, 53·38; common, 2·96; rejected, 0·56; condemned, Nil: total, 100.

Tow.—During the month 2,276 bales were dealt with, as compared with 3,836 for the corresponding month of last year, a decrease of 1,560 bales.

HEMP AND TOW GRADED THROUGHOUT THE DOMINION DURING THE MONTH OF MAY, 1911.

Hemp.

Port.	Superior.	Fine.	Good Fair.	Fair.	Common.	Rejected.	Condemned.	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland ..	..	..	89	530	36	18	..	673
Napier ..	..	..	..	..	..	..	..	..
Foxton ..	..	88	1,288	1,621	147	25	..	3,169
Wellington ..	..	63	1,569	1,786	48	..	..	3,466
Blenheim ..	..	..	..	..	..	..	..	..
Picton ..	..	109	..	..	..	..	..	109
Lyttelton ..	..	..	..	..	..	..	..	..
Dunedin ..	..	..	144	8	..	..	..	152
Bluff ..	..	..	3	205	..	..	..	208
Totals ..	..	260	3,093	4,150	231	43	..	7,777
Percentages of total	..	3·35	39·75	53·38	2·96	0·56	..	100

Tow.

Port.	First Grade.	Second Grade.	Third Grade.	Condemned.	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland ..	44	30	71	38	183
Napier ..	..	..	..	..	..
Foxton ..	366	557	7	7	937
Wellington ..	166	744	46	..	956
Blenheim ..	..	..	..	..	..
Picton ..	70	..	..	..	70
Lyttelton ..	..	..	..	..	..
Dunedin ..	..	101	12	2	115
Bluff ..	..	..	15	..	15
Totals ..	646	1,432	151	47	2,276

THE BRITISH PRODUCE-MARKET.

HIGH COMMISSIONER'S MARKET REPORT.

THE Commerce and Tourists Division of the Department of Agriculture, Commerce, and Tourists has received the following cablegram from the High Commissioner for New Zealand, London. (Quotations, unless otherwise specified, are average market prices on spot.)

20th May, 1911.

Mutton.—The market is very firm, and there is a good demand for prime-quality mutton. River Plate is in large supply. Canterbury 3⅞d., North Island 3⅝d., per lb.

Lamb.—The market is firm, and there is a good demand for all lamb. Canterbury 4⅝d., other than Canterbury 4¼d., per lb.

Beef.—The market is quiet. Supplies of American chilled beef are large. New Zealand hinds 3⅜d., fores 2⅜d., per lb.

Butter.—The market is dull. Buyers are holding back expecting prices to go lower. Choicest New Zealand butter 105s., Australian 98s., Danish 108s., Siberian 96s., per cwt.

Cheese.—The market is dull. Some buyers are forcing sales. New Zealand 59s. per cwt.; but have just been informed that there are sellers at 57s. 6d.

Hemp.—The market is dull. I expect no immediate change in the market. New Zealand good-fair on spot £20 5s., fair grade £19 5s., per ton. Forward shipment at the same price. Fair current Manila on spot £18 10s., forward shipment £19, per ton. The output for the week from Manila was 26,000 bales.

Wheat.—The market is firm, owing to reduced supplies. New Zealand long-berried wheat 35s. 6d., short-berried 34s., *ex* granary, per quarter of 496 lb.

Oats.—The market is firm, but demand only moderate. New Zealand oats, short sparrow-bills, *ex* granary, 20s. 6d., per quarter of 384 lb.; Danish, 17s. 6d., per quarter of 320 lb.

Beans.—The market is quiet, but holders are firm. New Zealand beans f.a.q. (old crop) 35s. per 504 lb.

Peas.—The market is quiet, and may go lower. New Zealand peas (partridge) 42s. 6d. per 504 lb.

Wool.—The market is firm, but not advanced.

Pork.—Not quoted. The season has ended.

3rd June, 1911.

Mutton.—The market remains firm. High prices are restricting business in the market. A moderate demand. Nominally Canterbury 3⅞d., North Island 3¾d. per lb.

Lamb.—The market is firm, and there is a good demand for all qualities, especially for light weight. Tendency upward for forward deliveries. Canterbury 4⅝d., other than Canterbury 4½d., per lb.

Beef.—The market is very quiet, and there is nothing doing. The low price of chilled keeps the market dull. New Zealand hinds 3⅜d., fores 2⅜d., per lb.

Pork.—There is little demand. The average price is 4½d. per lb.

Butter.—The market is dull: there is a fair demand for better grades. Stock is small. Choicest New Zealand butter 104s., Australian 98s., Danish 108s., Siberian 96s., per cwt.

Cheese.—The market is quiet, but rather steadier. New Zealand white 56s., coloured 57s., per cwt.

Hemp.—The market is quiet, and small business is doing. Prices are firmer. New Zealand good fair on spot £20 15s., fair grade £19 15s., fair current Manila £20, per ton. Forward shipment: New Zealand good fair £21, fair grade £20, Manila £21 per ton. The output from Manila for the week was 23,000 bales. Stock of New Zealand hemp, 715 tons.

Cocksfoot-seed.—There has been no alteration in the market since last week.

Wool.—Market unchanged. Quotations for Bradford tops as follows: 36's (low crossbreds) 1s. 1½d., 40's (low crossbreds) 1s. 2¼d., 44's (medium crossbreds) 1s. 3d., 50's (half-breds) 1s. 6¼d., 56's (quarter-breds) 1s. 9¼d., 60's (merinos) 2s. 2½d., per lb.

Mutton and Lamb.—River Plate shipments received during May, 1911, as follows:—

	Mutton. Carcases.	Lamb. Carcases.
London	31,166	30,486
Liverpool	178,417	120,570
Hull	11,905	1,757
Newcastle	17,684	8,878
Southampton	7,625	5,402
Cardiff	10,000	500
Ireland	4,223	15
	261,020	159,608
May, 1910	378,976	82,712

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COLONIAL-WOOL SALES.

The Commerce and Tourists Division of the Department of Agriculture, Commerce, and Tourists has received the following cablegram from the High Commissioner, dated London, 26th May, 1911, regarding the closing of the third series of colonial-wool sales:—

"The wool-sales have closed; the advance secured at opening has been lost. Values are now about the same as at the end of last sale. Trade is good, and manufacturers are busy. Prospects are favourable. The market is steady, and likely to remain so. 21,000 bales of New Zealand wool are held over."

The estimated values of New Zealand wools at the close of the second series of colonial-wool sales held in London on the 1st April, 1911, were as follows: Superior merino, 1s. to 1s. 2d. per lb.; medium, 10d. to 11½d.; inferior, 8d. to 9½d.; fine crossbreds, 11½d. to 1s. 2d.; medium crossbreds, 9d. to 11d.; coarse, 8½d. to 10d.

SHIPMENTS FROM COMMONWEALTH.

The following shipments of produce were despatched from the Commonwealth to the United Kingdom during April, 1911:—

Mutton (carcases)	46,818
Lamb (carcases)	29,632
Beef (quarters)	448
,, (cwt.)	67,982
Butter (cwt.)	144,307